Kochi Metro Sahodaya

CBSE Senior Secondary School Examination

MODEL QUESTION PAPERS

of All Subjects with Marking Scheme

GRADE - XII (2020-21)

INDEX

Kochi Metro Sahodaya

AISSCE MODEL EXAMINATION 2020 - 2021

ACCOUNTANCY

Marks : 80

Class : XII **Time : 3 Hrs**

General Instructions

1. *This question paper comprises two parts-Aand B. There are 32 questions in the question paper. All questions are compulsory*
2. *Question numbers 1 to 13 and 23 to 29 are very short answer type questions carrying 1 mark each.*
3. *Question numbers 14 and 30 are short answer type-1 questions carrying 3 marks each.*
4. *Question numbers 15 to 18 and 31 are short answer type-2 questions carrying 4 marks each.*
5. *Question numbers 19,20 and 32 are long answer type-1 questions carrying 6 marks each.*
6. *Question numbers 21 and 22 are long answer type-2 questions carrying 8 marks each.*
7. *There is no overall choice. However, an internal choice has been provided in two questions of 3 marks, two questions of 4 marks and two questions of 8 marks.*

Part - A

1. A and B are partners in a firm without any agreement. A has withdrawn Rs. 50,000 out of his capital as drawings. Interest on drawings maybe charged from A by the firm :
(a) @ 5%p.a (b) @ 6% p.a (c) @ 6% p.m (d) No interest can be charged. 1

2. X and Y were partners in a firm sharing profit or loss equally. With effect from 1st April, 2019 they agreed to share profits in the ratio of 4 : 3. Due to change in profit sharing ratio, B's gain or sacrifice will be
(a) Gain 1/14 (b) Sacrifice 1/14 (c) Gain 4/7 (d) Sacrifice 3/7 1

3. P, Q and R are partners sharing in the ratio of 5 : 4 : 3. They admit S for 1/7th share. It is agreed that Q would retain his original share. Sacrificing ratio will be
(a)P, Q and R 5 : 4 : 3 (b) P and R 4 : 3 (c) P and R 5 : 4 (d) P and R 5 : 3 1

4. The portion of capital which can be called-up only on the winding up of the company is called -----.
(a) Authorised capital (b) Called up capital (c) Uncalled capital (d) Reserve capital. 1

5. P, Q and R sharing profits and losses equally. R retires and the goodwill isappearing in the books at Rs. 30,000. Good will of the firm is valued at Rs. 1,50,000. Calculate the net amount to be credited to R's capital a/c.
(a) 60,000 (b) 50,000 (c) 40,000 (d) 10,000. 1

6. Realisation expenses Rs. 15,000 were paid by the firm on behalf of a partner. The journal entry passed will be :
   (a) Realisation a/c ...Dr 15,000
   To cash/bank a/c 15,000
   (b) Realisation a/c ...Dr 15,000
   To concerned partner's capital a/c 15,000
   (c) Concerned partner's capital a/c ...Dr 15,000
   To cash / bank a/c 15,0000
   (d) Cash / Bank a/c ...Dr 15,000
   To Realisation a/c 15,000 1

7. Credit purchase of stationery is Rs. 64,000, which is 80% of total purchases, compute cash purchase of stationery.
(a) 16,000 (b) 24,000 (c) 8,000 (d) 40,000 1

8. A company issued 5,000, 7% Debentures of Rs. 100 each at a price of Rs. 94. It will pay interest on debentures @ --------- on ----------. 1

9. Which of the following statement is true ?
   (a) A minor cannot be admitted as a partner
   (b) A minor can be admitted as a partner, only into the benefits of the firm
   (c) A minor can be admitted as a partner but his rights and liabilities are same of adult partner.
   (d) None of the above. 1

10. A manager gets 5% commission on net profit after charging such commission, gross profit Rs. 5,80,000and expenses of indirect nature other than manager's commission are Rs. 1,60,000. Commission amount will be
   (a) 21,000 (b) 20,000 (c) 15,000 (d) 22,000 1

11. Eiya, Diya and Raman are partners , sharing profits i n the ratio of 2 : 2 : 1. Diya died on 30th June 2020 and profits for the accounting year 2019 - 2020 were Rs. 36,000. The share of profit will be credited to Diya for the period 1st April 2020 to 30th June 2020 is --------. 1

12. On dissolution, Goodwill account is transferred to
   (a) In the capital a/c of the partners (b) On the credit of cash a/c
   (c) On the debit of realisation a/c (d) On the credit of realisation a/c. 1

13. A, B and C are partners sharing profits and losses in the ratio of 2 : 2 : 1. B retired from the firm. At that time goodwill of the firm was valued at Rs. 30,000. What contribution has to be made by A and C to pay B ?
   (a) 20,000 & 10,000 (b) 15,000 & 15,000 (c) 8,000 & 4,000 (d) 6,000 & 6,000. 1

14. From the following extract of Receipts & Payments a/c and additional information you are required to calculate subscription for the year ended 31/3/2020.

RECEIPTS AND PAYMENTS A/C

Receipts

To subscription	
2018 - 19	18,000
2019 - 20	1,00,000
2020 - 21	25,000
	1,43,000

Additional information
(1) Outstanding subscription on 31 - 3 - 2019 Rs. 20,000.
(2) Outstanding subscription on 31 - 3 - 2020 Rs. 30,000.
(3) Subscription received in advance as 31 - 3 - 2019 Rs. 20,000.

OR

On the basis of the information given below calculate the amount of stationery to be debited to Income & Expenditure on 31/ 3/ 2019.

	1st April 2018	*31st March 2019*
Stock of stationery	80,000	60,000
Creditors for stationery	90,000	1,10,000

Stationery purchased during the year ended 31 - 3 - 2019 was 4,70,000. 3

15. Amit, Sumit and Vineet have started business on 1st April 2019 with capital of Rs. 56,000, 44,800 and 33,600 respectively. After distributing the profit of Rs. 67,200 for the year ended 31st March 2020 in their agreed ratio of 3 : 1 : 1. It was found that following items were not taken into considerarion in the books of accounts for the year ended 31st March 2020:
   (1) Interest on capital at 10% p.a.
   (2) Commision to Amit was RS. 6,720
   (3) Salary due to Amit was Rs. 11,200 and Sumit was Rs. 16,800
   (4) Interest on drawings Amit Rs.784, Sumit Rs. 560 and Vineet Rs. 336.

You are required to pass a single journal entry in the beginning of the next year to rectify the above omissions.

OR

A, B and C are partners having capitals of Rs. 10,00,000, Rs. 8,00,000 and Rs. 6,00,000 respectively in a firm and sharing profits and losses equally. C is guaranteed a minimum profit of Rs. 1,00,000as share of profit every year. The firm incurred a loss of Rs. 3,00,000 for the year ended 31st March 2020. You are required to show the necessary accounts for division of loss and giving effect to minimum guaranteed profit to C. 4

16. From the following information complete journal entries

Date	Particulars		L.F	Amount	Amount
	Share capital a/c...	...Dr		?	
	To Share Forfeiture a/c				?
	To Calls in arrears a/c				3,000
	(---Shares are forfeited for non-payment of ---per share)				
	Bank a/c	...Dr		?	
	Share Forfeiture a/c . . .	...Dr		?	
	ToShare capital a/c				?
	(---shares re- issued at'8 per share as fully paid up)				
	Share forfeiture a/c . . . . . Dr			600	
	To capital reserve a/c				600
	(Balance of share forfeiture a/c transferred to capital reserve)				

SHARE FORFEITURE A/C

To Share capital a/c	?	By Share Capital a/c	2,000
To Capital Reserve a/c	600		
To balance c/d	800		
	2,000		2,000

4

17. Pass Journal entries for the following transaction in the books of X, Y and Z sharing profits in the ratio of 3 : 2 : 1 at the time of dissolution of the firm.

(a) Realisation expenses of Rs. 2,000 were to be borne and also paid by X, partner.

(b) Y, a partner to bear realisation expenses agreed at Rs. 1,900. Actual expenses paid by X were Rs. 1,500.

(c) Z, a partner , agreed to pay a creditor of 30,000 for Rs. 20,000.

(d) There was a contingent liability of Rs. 37,000 in respect of bills discounted but not matured. All the discounted bills were honoured but an acceptor of a bill of Rs. 5,000became insolvent and fifty paise in a rupee was received. The liability of the firm on account of this bill discounted and dishonoured has not so far been recorded. 4

18. Bose, Sarkar and Chatterjee are partners in a firm and do not have a Partnership Deed. Bose introduced further capital of Rs. 2,00,000 on 1st October 2019. Whereas Chatterjee took a loan of Rs. 50,000 from the firm on 1st October 2019. Disputes have arisen among them on the following issues;

(a) Bose demands interest @ 10% p.a.on Rs. 2,00,000 being his extra capital.

(b) Sarkar desires that his son Deep should be admitted as partner and he will give him half of his share. Bose and Chatterjee do not agree.

(c) Bose and Sarkar are of the view that Chatterjee should be charged interest on loan from the firm at the lending rate of the banks which is 12% p.a.

(d) Sarkar has withdrawn Rs. 50,000 from the firm for his personal use. Bose and Chatterjee are of the view that Sarkar should be charged interest @ 10% p.a.

You are required to give solution to each issue of dispute. 4

19. From the following Receipts and Payments Account of Defence club and from the information supplied, prepare Income and Expenditure Account for the year ended 31st March, 2020.

RECEIPTS AND PAYMENTS ACCOUNT

for the year ended 31st March 2020

Receipts		***Amt***	***Payments***	***Amt***
To balance b/d		3,50,000	By salaries	14,00,000
To subscriptions:			By General Expenses	3,00,000
2018 - 19	2,50,000		By Electricity Charges	2,00,000
2019 - 20	10,00,000		By Books	5,00,000
2020 - 21	2,00,000		By News papers	4,00,000
		14,50,000	By balance c/d	2,00,000
To Rent (from the use of hall)		7,00,000		
To Surplus from Entertainment		2,00,000		
To Legacy Donation		2,00,000		
To Sale of old newspapers		1,00,000		
		30,00,000		30,00,000

Additional information

1. The club has 50 members each paying an annual subscription of Rs. 25,000. Subscriptions outstanding on 31st March 2019 were to the extent of Rs. 3,00,000.
2. On 31st March , 2020, salaries outstanding amounted Rs. 1,00,000. Salaries paid during 2019 - 2020 included Rs. 3,00,000 for the year 2018 - 2019.
3. On 1st April, 2019,the club owned Buiding valued at 1,00,00,000. Furniture worth Rs. 10,00,000 and Books Rs. 10,00,000.
4. Legacy Donation is for construction of Gymnasium. 6

20. (a) Pass journal entries for the following transactions

Green Ltd. purchased plant & machinery for Rs. 2,00,000 payable as Rs. 65,000 by three months post - dated cheque and the balance by issue of debentures of Rs. 100 each at a discount of 10%. The company has balance of Rs. 10,000 in Securities Premium Reserve. It decided to write off discount from Securites Premium Reserve up to the balance in the account.

(b) Adarsh Cosmetics Ltd. issued 5,000 , 9% debentures of Rs. 100 each on 1st April 2020 redeemable at a premium of 8% after 10 years. According to the terms of prospectus Rs. 40 is payable on application and the balance on allotment of debentures. Pass the necessary entries regarding issue of debentures. 6

21. Following is the Balance Sheet of Subash and Asha as at 31st March, 2020 sharing profits in the ratio of 3 : 2.

BALANCE SHEET

Liabilities	***Amt***	***Assets***		***Amt***
Creditors	10,000	stock		11,000
Employees Provident Fund	8,000	Bank		21,000
General Reserve	30,000	Land & Building		18,000
Workmen Compensation Reserve	15,000	Plant & Machinery		12,000
Capital a/cs		Advertisement suspense		5,000
Subash - 15,000		Debtors -	22,000	
Asha -10,000	25,000	Less provision-	1,000	21,000
	88,000			88,000

They admit Tanya as a partner on 1st April 2020 for 1/6th share in the profits. It was decided that;

(a) Value of land & building be increased by 3,000 & stock be increases by 2,500

(b) Provision be increased by 1,500

(c) A Bill of exchange of Rs. 10,000 which was previously discounted with the banker, was dishonoured on 31 - 3 - 2020 but no entry has been passed for dishonour.

(d) Liability against workmen compensation reserve was determined at Rs. 20,000.

(e) Tanya brought Rs. 10,000 by cheque as her share of goodwill.

(f) Tanya was to bring in further cheque of Rs. 15,000 as her capital.

Pass necessary Journal Entries

OR

Pankaj, Nareh and Saurabh are partners sharing profits in the ratio of 3 : 2 : !. On 1st April 2020, Nareh retired and on that date, Balance Sheet of the firm was as follows;

Liabilities	***Amt***	***Assets***		***Amt***
General reserve	12,000	Bank		7,600
Creditors	15,000	Debtors		6,000
Bills payable	12,000	Less provion	400	5,600
Outstanding salary				2,200
Stock	9.000			
Provision for legal damages	6,000	Furniture		41,000
Capital a/cs		Premises		80,000
Pankaj - 46,000				
Naresh -30,000				
Saurabh -20,000	96,000			
	1,43,200			1,43,200
	======			======

Additional information

(a) Premises have appreciated by 20 %, stock depreciated by 10 % and provision for doubtful debt was to be made 5% on debtors. Furhter provison for legal charges is to be made for Rs. 1,200 and furniture to be brought upto Rs. 45,000.

(b) Goodwill of the firm is valued at Rs. 42,000.

(c) Rs. 26,000 from Naresh's capital a/c be transferred to his loan a/c and balance be paid through bank; if required, necessary loan may be obtained from bank.

(d) New ratio is 5 : 1.

Give the necessary ledger a/cs and Balance Sheet of the firm after Naresh's retirement. 8

22. Sangitha Ltd. invited application for issuing 60,000 shares of Rs.10 each at par. The amount was payable as follows :

On application	Rs.2 per share
On Allotment	Rs.3 per share
On First and First call	Rs.5 per share

Application were received for 92,000 shares. Allotement was made on the following basis :

(i) To applicants for 40,000 shares - Full

(ii) To applicants for 50,000 shares - 40%

(iii) To applicants for 2,000 shares - nil. Most of this category had appliesd for less than 5 shares each.

Rs.1,08,000 was realized on account of allotment (excluding the amount carried from application money) and Rs. 2,50,000 on account of call.

The directors decided to forefeit shares of those applicants to whom full allotment was made and on

which allotment money was overdue

Pass journel entries in the books of Sangeethe Ltd. to record above transactions.

OR

Heera Ltd. invited applications for 50,000 shares of Rs.10 each at a premium of Rs.3. The money was payable as follows"

On application Rs.2 per share

On allotment Rs.6 per share(including premium)

On first call Rs.3 per share

On final call Rs.2 per share

The company received applications for 76,000 shares. Applications for 6,000 shares were totally rejected and their money was refunded. Remaining allotment was done on pro-rata basis.Excess money was adjusted on allotment. Mr.X, who applied for 630 shares has paid only application money. On his failure to pay allotment and first call, his shares were forefeited and reissued for Rs.9 per share as fully paid shares.Final call was received from remaining share holders. Journalise these transactions. 8

Part - B

23. Cash deposit with the bank with a maturity date after two months belongs towhich of the following in the cash flow statement:
(a) Investing activities (b) Financing activities
(c) Cash and Cash equivalents (d) Operating activities. 1

24. In a company's Balance Sheet provision for Employees Benefits to be settled within 12 months is shown under
(a) Non - current liabilities, (b) Current liabilities, (c) Non - current assets, (d) Current assets. 1

25. ----- Establishes the number of times amount invested in trade receivables is turned over in a year in relation to Revenue from Operations. 1

26. A transaction involving a decrease in Debt - Equity Ratio and increase in Current Ratio is
(a) Issue of debentures against the purchase of fixed assets (b) Issue of debentures for cash
(c) Redemption of Preference shares for cash (d)Issue of equity shares for cash. 1

27. Prepaid Insurance is shown as ---- in the Balance Sheet. 1

28. The ----ratios provide the information critical to the long runoperation of the firm.
(a) Liquidity (b) Activity (c) Solvency (d) profitability 1

29. Dividend received by financial enterpriseis shown in Cash Flow Statement under
(a) Operating (b) Investing (c) Financing (d) Genertal 1

30. Compute Trade Receivable Turnover Ratio from the following information
Total sales Rs. 5,20,000, Cash Sales 60% of the Credit Sales, Closing Debtors Rs. 80,000, Opening Debtors are 3/4 of Closing Debtors.

OR

Current liabilities of a company are Rs. 1,60,000. Its liquid ratio is 1.5 : 1 and current ratio is 2.5 : 1. Calculate Quick Assets and Current Assets. 3

31. From the following information, prepare a Comparative Statement of Profit and Loss.

Particulars	**31stMarch 2019**	**31st March 2018**
Revenue from Operations	30,00,000	20,00,000
Other incomes (% of Revenue from Operations)	20%	25%
Expenses(%of Revenue from Operations)	50%	40%
Tax rate	40%	40%

OR

Prepare a Common Size Balance Sheet of Sun Ltd. from the following information

BALANCE SHEET as at 31st March 2020

Particulars	Note No.	31st March 2020	31st March 2019
1 EQUITY AND LIABILITIES			
1. Shareholders' fund			
(a) Share capital		32,00,000	18,00,000
(b) Reserves & surplus		8,00,000	6,00,000
2. Non - current Liabilities			
Long term borrowings		16,00,000	12,00,000
3. Current Liabilities			
Short term borrowings		8,00,000	12,00,000
		64,00,000	48,00,000
		=======	=======
II ASSETS			
1. Non - current assets			
(a) Fixed assets - Tangible assets		18,00,000	16,00,000
(b) Non - current investment		8,00,000	6,00,000
2. Current assets			
(a) Inventories		10,00,000	8,00,000
(b) Trade Receivables		16,00,000	12,00,000
(c) Cash & cash equivalents		12,00,000	6,00,000
		64,00,000	48,00,000
		=======	=======

4

32. Prepare Cash Flow Statement for the year ended 31st March 2020 from the following Balance Sheet.

SUPER INDIA LIMITED

Balance Sheet as at 31st March 2020

Particulars	*Note. No*	*31 - 3 -2020*	*31 - 3 -2019*
I EQUITY AND LIABILITIES			
1. Shareholders' fund			
(a) Share capital		6,00,000	4,00,000
(b) Reserves & surplus (balance in profit & loss)		2,00,000	1,00,000
2. Non - current liabilities			
Long term borrowings		1,00,000	2,00,000
3. Current liabilities			
(a) Short term borrowings (Bank loan)		-------	10,000
(b) Trade Payables		45,000	60,000
(c) Short term provisions	1	70,000	40,000
		10,15,000	8,10,000
		=======	=======
II ASSETS			
1. Non - Current Assets			
(a) Fixes Assets			
Tangible (building)		6,00,000	6,00,000
Intangible (patent)		45,000	50,000
(b) Non current investment		75,000	-----

2.	***Current Assets***		
(a)	Inventories	15,000	10,000
(b)	Trade Receivables	1,95,000	1,20,000
(c)	Cash and Cash equivalents	85,000	30,000
		10,15,000	8,10.000

Notes to Accounts

Particulars	***31 - 3 2020***	***31 - 3 - 2019***
1. Short term provsions		
Provision for tax	70,000	40,000

Note:- Divident proposed for the years ended 31st March 2019 and 2020 are Rs. 60,000 and Rs. 80,000 respectively.

Additional Information

1. Building was purchased for Rs. 75,000.
2. An old building, the book value of which was Rs. 63,000, was sold at a loss of Rs. 5,000.
3. Tax provided during the year was Rs. 80,000.

(6)

Kochi Metro Sahodaya
Model Question Paper
ACCOUNTANCY

Grade: XII **Time: 3 hrs**
Marks: 80

General Instructions:

- ***This question paper contains two parts–A&B.***
- ***All parts of a question should be attempted at one place only.***

PART–A
(ACCOUNTING FOR NOT FOR PROFIT ORGANISATION, PARTNERSHIP FIRM AND COMPANIES)

1. Akash Ltd. acquired assets of Rs.20 lakh and took over creditors of Rs.2 lakh from Kapila Enterprises. Akash Ltd issued Equity shares of Rs.100 each at par as purchase consideration. What will be the amount of purchase consideration? **1**
   a. Rs. 20,00,000
   b. Rs. 2,00,000
   c. Rs. 18,00,000
   d. Rs. 10,00,000
2. On dissolution of a firm, bank overdraft is transferred to : **1**
   a. Cash Account
   b. Bank Account
   c. Realisation Account
   d. Partner's capital Account
3. If a fixed amount is withdrawn on the first day of every quarter of a financial year, the interest on total amount of drawings will be calculated for : **1**
   a. 4.5 months
   b. 5.5 months
   c. 6 months
   d. 7.5 months
4. Which of the following is not a capital receipt? **1**
   a. Donations for tournament
   b. Donations for building fund
   c. Life membership fee
   d. Entrance fees
5. Rita, Mita and Sita were partners sharing profits equally. At the time of dissolution of the partnership firm, Rita's loan to the firm will be : **1**
   a. Credited to Rita's Capital Account.
   b. Debited to Realisation Account.
   c. Credited to Realisation Account.
   d. Credited to Bank Account.

6. Gaurav, Harish and Pradeep are partners. On retirement of Gaurav, the goodwill already appears in the Balance Sheet at Rs. 24,000. The goodwill will be written-off: **1**
    a. By debiting retiring partners' capital accounts from his share of goodwill.
    b. By debiting remaining partners' capital accounts in their new profit-sharing ratio.
    c. By debiting all partners' capital accounts in their old profit-sharing ratio.
    d. None of these
7. Gold, Silver and Diamond were equal partners. They decided to change the profit sharing ratio to 4 : 3 : 2. For this purpose the goodwill of the firm was valued at Rs. 90,000. The journal entry for the treatment of Goodwill on change in profit sharing ratio will be : **1**

a.	Diamond's Capital A/c	Dr.	10,000	
	To Gold's Capital A/c			10,000
b.	Silver's Capital A/c	Dr.	10,000	
	To Gold's Capital A/c			10,000
c.	Gold's Capital A/c	Dr.	90,000	
	To Diamond's Capital A/c			90,000
d.	Gold's Capital A/c	Dr.	10,000	
	To Diamond's Capital A/c			10,000

8. The profits for the last years are Rs. 60,000; Rs. 40,000 and Rs. 66,500. The total assets of the firm are Rs. 10,00,000 and outside liabilities are Rs. 5,42,500. The rate of interest expected from capital invested is 10%. The value of goodwill on capitalisation basis is: **1**
    a. Rs. 97,000
    b. Rs. 97,250
    c. Rs. 97,500
    d. Rs. 97,750
9. Astha and Rachit are partners sharing profit in the ratio of 2:1. Astha's daughter Gauri was admitted for 1/4 share of which 1/8 was gifted by Astha to her daughter. The remaining was contributed by Rachit. Goodwill of the firm in valued at Rs. 40,000. How much of the goodwill will be credited to the old partner's capital account. **1**
    a. Rs. 2,500 each
    b. Rs. 5,000 each
    c. Rs. 20,000 each
    d. None of the above
10. Kush, Laksh, Manu and Narmada are partners sharing profits in the ratio of 3 : 2 : 1 : 4. Kush retires and his share is acquired by Laksh and Manu in the ratio of 3:2. Calculate new profit sharing ratio of the remaining partners. **1**
    a. 19 : 11 : 20
    b. 9 : 11 : 20
    c. 12 : 10 : 20
    d. 19 : 11 : 12
11. Excess of issue price of a Share over its face value is called _____. **1**
12. _____ Capital is the amount of share capital which a company is authorised to issue by its Memorandum of Association. **1**

13. Can death of a partner be termed as Reconstitution of partnership firm'? Give reason in support of your answer. **1**

14. From the following information of a sports club, calculate the amount of sports material consumed during the year that would appear in the Income and Expenditure Account for the year ending 31st March, 2020 : **3**

Stock of Sports Material on 1.4.2019	Rs.30,000
Creditors for Sports Material 1.4.2019	Rs.20,000
Stock of Sports Material 31.3.2020	Rs.5,000
Creditors for Sports Material 31.3.2020	Rs.12,500
Advances for Sports Material 31.3.2020	Rs.11,000
Credit purchases of Sports Material during the year	Rs.1,38,000
Cash purchases of Sports Material during the year	Rs.23,250

OR

As per Receipt and Payment Account for the year ended on March 31, 2020, the subscriptions received were Rs. 2,50,000. Additional Information given is as follows:

a. Subscriptions Outstanding on 1.4.2019 Rs. 50,000
b. Subscriptions Outstanding on 31.3.2020 Rs. 35,000
c. Subscriptions Received in Advance as on 1.4.2019 Rs. 25,000
d. Subscriptions Received in Advance as on 31.3.2020 Rs. 30,000

Ascertain the amount of income from subscriptions for the year 2019–20 by preparing Subscription Account.

15. Tanmay Ltd. had an authorized capital of 2,00,000 equity shares of Rs. 10 each. The company offered to the public for subscription 1,00,000 shares. Applications were received for 97,000 shares. The amount was payable as follows on application was Rs. 2 per share, Rs. 4 was payable each on allotment and first and final call. A shareholder holding 600 shares failed to pay the allotment money. His shares were forfeited. The company did not make the first and final call. Present the share capital in the Balance Sheet of the company as per Schedule III of the Companies Act, 2013. Also prepare Notes to accounts. **4**

16. Anita, Asha and Amrit are partners sharing profits in the ratio 3 : 2 : 1 respectively. From 1st April, 2019 they decided to share future profits in the ratio of 2 : 3 : 1. The partnership deed provides that in the event of any change in profit sharing ratio, the goodwill should be valued at three years' purchase of the average of five years' profits. The profits and losses of the preceding five years are:

Profits- I - Rs.1,20,000; II - Rs.3,00,000; III - Rs.3,40,000; IV- Rs.3,80,000; V - Rs. 1,40,000 (loss)

Pass the necessary journal entry to record the above change. **4**

OR

Sam, Siya and Riya were partners in a firm sharing profits and losses in the ratio of 5 : 3 : 2. With effect from 1st April, 2019, they agreed to share future profits and losses in the ratio of 2 : 5 : 3. Their Balance Sheet showed a debit balance of Rs.50,000 in the Profit and Loss Account and a balance of Rs. 40,000 in the Investment Fluctuation Fund. For this purpose, it was agreed that :

(i) Goodwill of the firm be valued at Rs.3,00,000.

(ii) Investments of book value of Rs.5,00,000 be valued at Rs. 4,80,000.

Pass the necessary journal entries to record the above transactions in the books of the firm.

17. Shiv and Ram share profits and losses in the ratio of 2:1. They admit Vishnu as partner with 1/4th share in profits with a guarantee that his share of profit shall be at least Rs.1,00,000. The net profit of the firm for the year ending March 31, 2020 was Rs.3,60,000. Prepare Profit and Loss Appropriation Account. Show your workings clearly. **4**

18. P, Q and R were partners in a firm. Q died on 31st December,2019. Q's share of profit from the closure of the last accounting year till the date of death was to be calculated on the basis of the average of three completed years of profits before death. Profits for the year ending 31st March 2017, 2018 and 2019 were Rs.92,000; Rs.1,50,000 and Rs.2,44,000 respectively. The firm closes its books on 31st March every year. **4**

Calculate Q's share of profit till the date of his death and pass the journal entry for the same.

19. Radha, Krishna and Balram are partners sharing profits and losses in the ratio of 14 : 5 : 6 respectively. Krishna retires and surrenders 5/25th of his share in favour of Radha and remaining share to Balram. The goodwill of the firm is valued at 2 years' purchase of super profits based on average of last 3 years. The profits for the last three years are: Rs. 50,000; Rs.55,000 and Rs. 60,000. The normal profits for similar firm are Rs. 30,000. Goodwill already appearing in the books of the firm was Rs. 75,000. The profit for the first year after Krishna's retirement was Rs. 1,00,000.

Pass the necessary journal entries to adjust goodwill and to distribute profits. Show your workings. **6**

20. Harish and Gopal were partners in a firm sharing profits in the ratio of 3 : 2. On 31st March, 2018, their Balance Sheet was as follows :

Balance Sheet of Harish and Gopal as at March 31, 2018

LIABILITIES	AMOUNT	ASSETS	AMOUNT
Creditors	36,000	Cash	47,000
Outstanding expenses	10,000	Bank	93,000
Gopal's wife's loan	50,000	Debtors	76,000
Capitals:		Stock	2,00,000
Harish 2,80,000		Furniture	20,000
Gopal 1,60,000	4,40,000	Leasehold premises	1,00,000
	5,36,000		5,36,000

On the above date the firm was dissolved. The various assets were realised and liabilities were settled as under :

(i) Gopal agreed to pay his wife's loan.

(ii) Leasehold premises realised Rs. 1,50,000 and Debtors Rs. 12,000 less.

(iii) Half of the creditors agreed to accept furniture of the firm as full settlement of their claim and remaining half agreed to accept 10% less.

(iv) 50% stock was taken over by Harish on payment by cheque of Rs. 90,000 and remaining stock was sold for Rs. 94,000.

(v) Realisation expenses of Rs. 10,000 were paid by Gopal on behalf of the firm.

Prepare Realisation Account. **6**

OR

Raja, Rani and Rita were partners in a firm sharing profits and losses in the ratio of 2 : 2 : 1. The firm was dissolved on 31st March, 2020. After the transfer of assets (other than cash) and external liabilities to the Realisation Account, the following transactions took place :

(i) A debtor, whose debt of Rs. 90,000 had been written off as bad, paid Rs. 88,000 in full settlement.

(ii) Creditors to whom Rs. 1,21,000 were due to be paid, accepted stock at Rs. 71,000and the balance was paid to them by a cheque.

(iii) Rani had given a loan to the firm of Rs. 18,000. He was paid Rs. 17,000 in full settlement of his loan.

(iv) Investments were Rs. 53,000 out of which investments worth Rs. 43,000 were taken over by Raja at Rs. 52,000 and the balance of the investments were sold for Rs. 12,000.

(v) Expenses on dissolution amounted to Rs. 19,000 and the same were paid by the firm.

(vi) Profit on dissolution amounted to Rs. 30,000.

Pass the necessary journal entries for the above transactions in the books of the firm.

21. Himadri Limited issued 10,000 equity shares of 100 each payable as follows: Rs. 20 on application, Rs. 30 on allotment, Rs. 20 on first call and Rs. 30 on second and final calls 10,000 shares were applied for and allotted. All money due was received with the exception of both calls on 300 shares held by Supriya. These shares were forfeited. Give necessary journal entries. **8**

OR

Jain Ltd. invited applications for issuing 1,12,000 equity shares of Rs. 10 each at par. The amount per share was payable as follows:

On Application – Rs. 1

On Allotment – Rs. 2

On First call – Rs. 3

On Second and Final call – Rs. 4

Applications for 1,00,000 shares were received. Shares were fully allotted to all the applicants. Ramesh failed to pay his allotment money which was Rs. 2,000. His shares were forfeited immediately. Suresh did not pay the first call on 500 shares applied by him. His shares were forfeited after the first call. Afterwards the second and final call was made and was duly received. Pass necessary journal entries for the above transactions in the books of Jain Ltd

22. A and B are partners in a firm sharing profits in the ratio 2:1. The Balance Sheet of A and B as on March 31, 2020 was as under:

LIABILITIES	AMOUNT	ASSETS	AMOUNT
Creditors	8,000	Cash	2,000
Bills payable	4,000	Bank	10,000
General Reserve	6,000	Debtors	8,000
Capitals :		Stock	10,000
A 50,000		Furniture	5,000
B 32,000	82,000	Machinery	25,000
		Building	40,000
	1,00,000		1,00,000

C is admitted into the firm with 1/4 share in profits. He will bring in Rs. 30,000 as capital. Other terms of agreement are as under:

a) C will bring in Rs. 12,000 as his share of goodwill.

b) Building was valued at Rs. 45,000 and Machinery at Rs. 23,000.

c) A provision for bad debts is to be created @ 6% on debtors.

Show necessary ledger accounts and prepare firm's Balance Sheet after C's admission. **8**

OR

Gaurav, Rakesh and Garvita were partners in a firm sharing profits and losses in the ratio of 3:5:2. On 31st March, 2020, their balance sheet was as follows :

LIABILITIES	AMOUNT	ASSETS	AMOUNT
Creditors	60,000	Cash	50,000
General Reserve	40,000	Debtors	40,000
Capitals :		Stock	80,000
Gaurav 3,00,000		Investments	30,000
Rakesh 2,00,000		Buildings	5,00,000
Garvita 1,00,000	6,00,000		
	7,00,000		7,00,000

Rakesh retired on the above date and it was agreed that :

(a) Goodwill of the firm be valued at Rs. 3,00,000.

(b) Stock was to be appreciated by 20%.

(c) Buildings were found undervalued by Rs. 1,00,000.

(d) Investments were sold for Rs. 34,000.

Prepare Revaluation Account, Partner's Capital Accounts and the Balance Sheet of the reconstituted firm on Rakesh's retirement.

PART–B
(ANALYSISOFFINANCIALSTATEMENT)

23. Which of the following is not a tool of Financial Statement Analysis? **1**
    a. Cash Flow Statement
    b. Ratio Analysis
    c. Securities Analysis
    d. Comparative Statement
24. Which of the following is not a component of other income? **1**
    a. Dividend Income
    b. Proceeds from sale of scrape
    c. Interest Income
    d. Gain on sale of Investment
25. Finserve Ltd, is carrying a Mutual Fund business. It invested Rs.30,00,000 in shares & Rs.15,00,000 in debentures of various companies during the year. It received Rs.3,00,000 as dividend & interest. Find out cash flow from investing activities. **1**
26. Debt Equity Ratio=$\frac{\text{.....}}{\text{Rs.5,00,000}}$= 0.36:1 **1**

27. Interest paid on long term borrowings will be classified as_____ Activity while preparing Cash Flow statement. **1**

28. Intra-firm Analysis is also known as_____ Analysis. **1**

29. Purchase of goods on credit will result into decrease in the Quick Ratio, if the Quick Ratio of a company is 2:1. State True or False. **1**

30. Under what head & sub-head the following items will appear in the balance sheet of a company as per Schedule III, Part–I of the Companies Act 2013:
    (i) Premium on redemption of Debentures
    (ii) Balances with Bank
    (iii) Tax Reserves **3**

OR

A company had a Liquid Ratio of 1.5:1, Current Ratio of 2 & Inventory Turnover Ratio of 6times. It had total Current Assets of Rs.8,00,000 in the year 2018. Find out Revenue from operation if goods are sold at 25% profit on cost.

31. With the help of the given information obtained from the books of XYZ Ltd., prepare a Comparative Statement of Profit & loss for the year ended 31.03.2019: **4**

Particulars	Note no	2018-19	2017-18
Revenue from operation		Rs.20,00,000	Rs.17,00,000
Cost of Revenue from Operation		70% of Revenue from Operations	60% of Revenue From Operations
Other expenses		Rs.42,000	Rs.68,000
Other Incomes		Rs.20,000	Rs.14,000
Tax		50%	50%

32. From the following balance sheet of Jyothi LTD. As at 31st March 2018, prepare a Cash Flow Statement: **6**

Particulars	Note no	31st March, 2018	31st March, 2017
I. EQUITY AND LIABILITIES			
1. Shareholders' Funds			
(a) Share capital		5,00,000	5,00,000
(b) Reserves and Surplus	1	1,00,000	(25,000)
2. Non-current liabilities			
Long term borrowings	2	2,50,000	1,50,000
3. Current liabilities			
(a) Short term borrowings	3	1,50,000	1,00,000
(b) Short term provision	4	1,25,000	75,000
Total		11,25,000	8,00,000
II. ASSETS			
1. Non-current Assets			
Fixed Assets-tangible	5	6,00,000	4,50,000
2. Current Assets			
(a) Trade receivables		2,75,000	2,25,000

Ko

(b) Cash and cash equivalents		50,000	25,000
(c) Short-term loan and advances		2,00,000	1,00,000
Total		11,25,000	8,00,000

Notes to accounts

Particulars	31st March, 2018	31st March, 2017
1. Reserves and Surplus		
Surplus, i.e. Balance in statement of profit and loss	1,00,000	(25,000)
2. Long term borrowings		
10% Debentures	2,50,000	1,50,000
3. Short term borrowings		
Bank overdraft	1,50,000	1,00,000
4. Short term provision		
Provision for tax	1,25,000	75,000
5. Tangible Assets		
Machinery	7,37,500	5,25,000
Accumulated depreciation	(1,37,500)	(75,000)

Additional Information:

a) Proposed dividend for the years ended 31st March, 2017 and 2018 are Rs.50,000 and Rs.75,000 respectively.

b) Rs.1,00,000, 10% debentures were issued on 31st March, 2018.

KOCHI METRO SAHODAYA
AISSCE MODEL EXAMINATION CLASS - XII (2020-2021)
BIOLOGY (044) Theory

Time: 3 Hours **Maximum Marks: 70**

General Instructions:

i. All questions are compulsory.
ii. The question paper has four sections: Section A. Section B, Section C and Section D. There are 33 questions in the question paper.
iii. Section –A has 14 questions of 1 mark each and 02 case-based questions. Section - B has 9 questions of 2 marks each. Section – C has 5 questions of 3 marks each and Section –D has 3 questions of 5 marks each.
iv. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
v. Wherever necessary, neat and properly labeled diagrams should be drawn.

……....

SECTION A

1. Which type of flowers produce assured seed set even in the absence of pollinators?
2. At what stage of development, does the human embryo gets implanted to inner lining of uterus?
3. Mention any two contrasting traits with respect to seeds in pea plant that were studied by Mendel.
4. What is a cistron?
5. Retroviruses have no DNA, however the DNA of the infected host cell does possess viral DNA. How is it possible?
6. Why is secondary immune response more intense than the primary immune response in humans?
7. Expand MALT? Where is it present in human body?
8. Milk starts to coagulate when lactic acid bacteria is added to warm milk as a starter. Mention any other two benefits which LAB provides.
9. Why do we prefer to call secondary waste water treatment as biological treatment?
10. How is Agrobacterium tumefaciens transform a normal plant cell into tumor?
11. Assertion : Natality rate increases the population size and population density both
    Reason: Natality increases the number of individuals in an area by birth.
    a. Both assertion and reason are true, and reason is the correct explanation of assertion.
    b. Both assertion and reason are true, but reason is not the correct explanation of assertion.
    c. Assertion is true but reason is false
    d. Both assertion and reason are false.
12. Assertion: In sigmoid growth curve, population finally stabilizes itself.
    Reason: Finally, the death rate increases than the birth rate.
    a. Both assertion and reason are true, and reason is the correct explanation of assertion.
    b. Both assertion and reason are true, but reason is not the correct explanation of assertion.
    c. Assertion is true but reason is false
    d. Both assertion and reason are false.
13. Assertion: For management of wild life, environmental pollution must be checked.
    Reason: Environment provides the life supporting system to wild life.

a. Both assertion and reason are true, and reason is the correct explanation of assertion.
b. Both assertion and reason are true, but reason is not the correct explanation of assertion.
c. Assertion is true but reason is false
d. Both assertion and reason are false.

14. Assertion : In wild life conservation there is no need to conserve micro organism
Reason: Microorganisms are not of much important to mankind.
    a. Both assertion and reason are true, and reason is the correct explanation of assertion.
    b. Both assertion and reason are true, but reason is not the correct explanation of assertion.
    c. Assertion is true but reason is false
    d. Both assertion and reason are false.

15. Read the following and answer any four questions from 15(i) to 15(v) given below:-

Biodiversity

Biodiversity describes the richness and variety of life on earth. It is the most complex and important feature of our planet. Without biodiversity, life would not sustain.

The term biodiversity was coined in 1985. It is important in natural as well as artificial ecosystems. It deals with nature's variety, the biosphere. It refers to variabilities among plants, animals and microorganism species.

Biodiversity includes the number of different organisms and their relative frequencies in an ecosystem. It also reflects the organization of organisms at different levels.

Biodiversity holds ecological and economic significance. It provides us with nourishment, housing, fuel, clothing and several other resources. It also extracts monetary benefits through tourism. Therefore, it is very important to have a good knowledge of biodiversity for a sustainable livelihood.

i. Genetic variation between distinct populations of the same species is known as

a. Genetic diversity b. Species diversity

c. Ecosystem diversity d. Biodiversity

ii. Dodo became extinct because

a. Global environmental changes b. Over exploitation of resources
c. Invasion of non native species d. Pollution

iii. Red data book deals with

a. Endemic plant b. Plants that are extinct

c. Animals on verge of extinction d. Plants showing photoperiodism

iv. Animals and plants are best protected in

a. Zoos b. Botanical gardens
c. Sanctuaries d. National parks

v. Hot spots of biodiversity are

a. Where maximum number of flora and fauna found.
b. Where maximum number of flora are found.
c. Where maximum diversity is found.
d. Where maximum natural resources are found.

16. **Biotechnology and Applications: -**

Biotechnology is a broad field that deals with the exploitation of living organisms to develop products beneficial for sustainable development. It harnesses cellular and molecular processes to develop products and technologies that could help in improving human life on earth. It has a variety of applications that focus on human welfare. Let us have an overview of major Biotechnology applications and its scope in today's scenario. Biotechnology is widely used in different fields such as medicine, agriculture, food processing, etc. to produce useful products for human benefits.

The major biotechnology applications are discussed below in detail.

Biotechnology has a variety of applications in the field of medicine. Some of the biotechnology applications in medicine include the following:

Insulin is required by diabetic patients to remove excess sugar from the blood. Diabetic patients have a very low level of insulin or no insulin produced by the body. Therefore, they need external insulin to control blood glucose levels. Later it was discovered that the insulin produced by the pancreas of the pigs can be used by humans. But there were not enough pigs to provide the quantities of insulin required. This led to the cloning of the human insulin gene.

The specific gene sequence that codes for human insulin were introduced in *E.coli bacteria*. The gene sequence altered the genetic composition of the *E.coli* cells. Within 24 hours several *E.coli* bacteria containing the recombinant human insulin gene were produced. The recombinant human insulin was isolated from *E.coli* cells.

(i) Bacillus thurinjiensis strains have been used for designing novel:

a. Biofertilisers b. Bio metallurgic techniques

c. Biomineralization d. Bio insecticidal plants

(ii) Which of the following inhibit the growth of viruses?

a. Antibiotics b. Interferons
c .Insulin d.Antibodies

(iii) The term Humulin is used for

a. Human insulin b. Hepatitis vaccine

c. Isoenzyme d. Proenzyme

(iv) Antibiotics are mostly got from

a. Fungi b. Bacteria

c. Both a and b d. Cyanobacteria

(v) Transgenic Animal has

a. Foreign DNA in all its cells
b. Foreign RNA in all its cells
c. Foreign DNA in some of the cells
d. Both b & c.

SECTION B

17. What type of embryos are developing in the seeds of Citrus and Mango and why?
18. After a successful in vitro fertilisation the fertilised egg begins to divide. Where is this egg transferred before it reaches the tage and what is this technique named?

19. With the help of one example, examine the phenomena of co-dominance and multiple allelism in human population.
20. Write the scientific name of fruit-fly. Why did Morgan prefer to work with fruit flies for his experiments? State any three reasons.

OR

Linkage or crossing over of genes are alternatives of each other. Justify with the help of an example.

21. Identify a, b, c and d from the following table.

Name of the disease	Causative organism	Organ / Part affected
1. Typhoid	Salmonella typhi	a
2. Common cold	b	c
3. Pneumonia	Streptococcus pneumonia	d

22. Name the host and site, where the following occur in the life cycle of a malarial parasite.
    a. Formation of gametocyte
    b. Fusion of gametocytes
23. Why must a cell have made 'competent' in biotechnology experiments. How does calcium ion help in doing so?
24. Why small animals rarely found in polar region? Explain.
25. With the help of an example explain how alien species invasion causes biodiversity loss?

SECTION C

26. Name two hormones that are constituents of contraceptive pills? Why do they have high and effective contraceptive value? Name a commonly prescribed non-steroidal oral pill.

OR

a. Mention the problems that are taken care by reproductive and Child Health Care programme.
b. What is amniocentesis and why there is a statutory ban on it?

27. What is a test cross? How can it decipher the heterozygosity of a plant?
28. It is established that RNA is the first genetic material. Explain giving 3 reasons.
29. a. Name a drug used (i) as an effective sedative and pain killer

    (ii)for helping patients to cope up with mental illness like depression, but often misused.

    b. How does the moderate and high usage of cocaine affect the human body?

30. Explain the role of the following in increasing the soil fertility.
    a. Leguminous plants b. Cyanobacteria c. Mycorrhiza

OR

Name the genus to which baculoviruses belong. Describe their role in integrated pest management programmes.

SECTION D

31. Write functions of the following
    a. Corpus luteum b. Endometrium
    c. Acrosome d. Sperm tail e. Fimbriae

OR

a. Draw a graph to show the ovarian hormone variations in menstrual cycle in females.
b. Name ovarian hormones, mention their roles.
c. Correlate and describe the uterine events that take place according to the ovarian hormone levels on

i. 6-15 days ii. 16-25 days
iii. 26-28 days (when ovum is not fertilised)

32. Work out a typical Mendelian dihybrid cross and state the law that he derived from it.

OR

Describe the Hershey and Chase experiment. Write the conclusion drawn by the scientist after their experiment.

33. How is transgenic tobacco plant protected against Meloidogyne incognita? Explain the procedure.

OR

a. Name the source of Taq polymerase. Explain the advantage of its use in biotechnology.
b. Expand ADA. Why is this enzyme essential in human body? Suggest a gene therapy for its deficiency.

Kochi Metro Sahodaya
Model Question Paper
Class XII
Biology (044) Theory

Time: 3hrs **Marks:70**

General Instructions:

(i) All questions are compulsory.

(ii) The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.

(iii) Section–A has 14 questions of 1 mark each and 02 case-based questions. Section–B has 9 questions of 2 marks each. Section–C has 5 questions of 3 marks each and Section–D has 3 questions of 5 marks each.

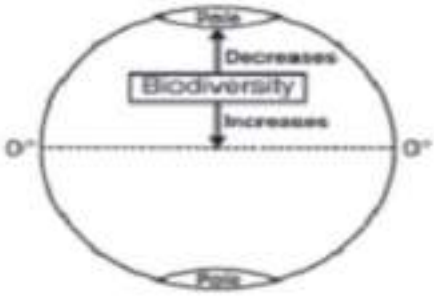
(iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION A		
	Questions	Mark
1.	If the diploid number of chromosomes in an angiospermic plant is 16. Mention number of chromosomes in the endosperm and antipodal cell.	1
2.	Lactational amenorrhea is a contraceptive method. List any two advantages.	1
3.	Mention any two activities of animals, which get cues from diurnal and seasonal variations in light intensity	1
4.	A male honeybee has 16 chromosomes. Whereas it's female has 32 chromosomes. Give reason	1
5.	Identify the recognition sites in the given sequences at which E.coli will be cut and make sticky ends. 5′-GAATTC-3′ 3′-CTTAAG-5′	1
6.	A multinational company outside India tried to sell new varieties of	1

turmeric without proper patent rights. What is such an act referred to?

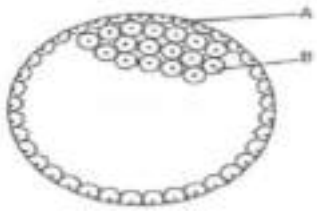
7. How do cytokine barriers provide innate immunity in humans? 1

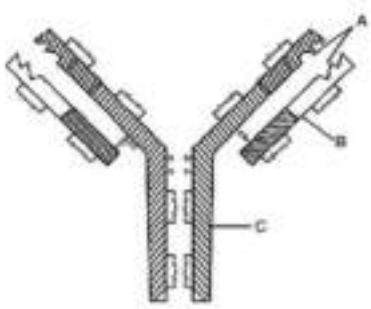
8.	Egrets are often seen along with grazing cattle. How do you refer to this interaction? Give reason.	1
9.	What are "cry genes"? In which organisms are they present.	1
10.	Study the diagram of the earth given below. Give the name of the pattern of biodiversity there in.  	1
11.	**Assertion:** The principle of segregation given by Mendel is the principle of purity of gametes. **Reason :** Gametes are pure for a character. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false d. Both assertion and reason are false. **OR** **Assertion:** In a monohybrid cross, F1 generation indicate dominant character. **Reason :** Dominance occurs only in heterozygous state. a. Both assertion and reason are true, and reason is the correct explanation of assertion	1

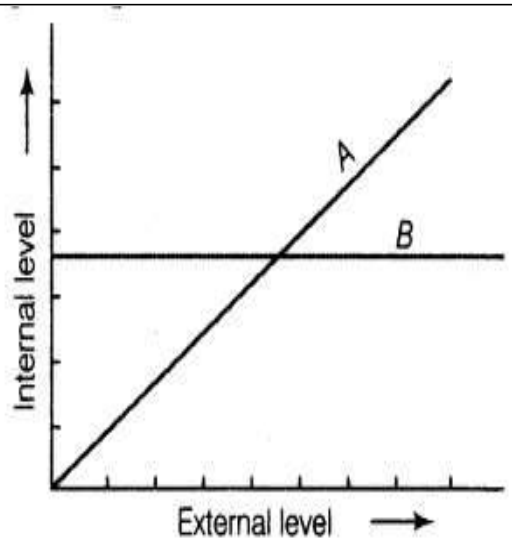
	b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false d. Both assertion and reason are false.	
12.	**Assertion:** Leguminous plants can grow well in nitrogen deficient soil. **Reason :** They need little nitrogen. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false d. Both assertion and reason are false.	1
13.	**Assertion:** The genetic code is degenerate. **Reason** : Most amino acids are coded by more than one codon. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false d. Both assertion and reason are false.	1
14.	**Assertion**: Plasmids are single stranded extrachromosomal DNA **Reason** : Plasmids are usually present in eukaryotic cell a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false d. Both assertion and reason are false.	1

15.	*Read the following and answer any **four** questions from 15(i) to 15(v) given below:* The **Human Genome Project** (**HGP**) was an international scientific research project with the goal of determining the base pairs that make up human DNA, and of identifying and mapping all of the genes of the human genome from both a physical and a functional standpoint. The aim of this project was to develop new technology and new information in the field of genomic studies. **The HGP** led to the growth of bioinformatics which is a vast field of research	4
i.	The official start of the research phase of the Human Genome Project was in what year? a. 1984 b. 2003 c. 1996 d. 1990	
ii.	How many genes constitute the human genome? a. More than one million b. 46 c. About 30000 d. One billion	
iii.	Which was the last human chromosome to be completely sequenced? a. Chromosome 1 b. Chromosome 11 c. Chromosome 21 d. Chromosome X	
iv.	The human chromosomes with least number of genes found	

	in a. Chromosome 1 b. Chromosome 11 c. Chromosome Y d. Chromosome X	
v.	**Assertion :** BAC & YAC are the common vectors used in HGP. **Reason :** In HGP, sequencing was done by automated DNA sequences that worked on methods of Frederick Sanger. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false d. Both assertion and reason are false.	
16.	*Read the following and answer any **four** questions from 16(i) to 16(v) given below:* Gene therapy is a collection of methods that allows correction of a gene defect that has been diagnosed in a child/embryo. Here genes are inserted into a person's cells and tissues to treat diseases. Correction of genetic defects involve delivery of a normal gene into the individual or embryo to take over the function of and compensate for the non –functional gene.	4
i.	Gene therapy was first done in the year of ---------- a. 1980 b. 1990 c. 1986 d. 1991	
ii.	Which of the following virus is commonly used for gene therapy as a vector? a. Papillomavirus b. Retrovirus c. Actinidia virus d. Tobacco virus 1	
iii.	What type of diseases was gene therapy first used for? a. HIV b. Cancer c. SCID d. Arthritis	
iv.	What is the permanent cure for the deficiency of adenosine	

	deaminase (ADA) a. Bone marrow transplantation b. Enzyme replacement therapy c. Gene therapy d. None of the above	
iv.	**Assertion:** In enzyme replacement therapy, ADA is given to the patient by injection. **Reason :** Enzyme replacement therapy is a permanent cure for immunodeficiency diseases. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false d. Both assertion and reason are false.	
	SECTION B	
17.	Name any two techniques that serve the purpose of early diagnosis of some bacterial/viral human diseases.	2
18.	How does our body adapt to low oxygen availability at high altitudes?	2
19.	A recombinant DNA is formed when sticky ends of vector DNA and foreign DNA join. Explain how the sticky ends are formed and get joined?	2
20.	Draw a labelled diagram of a nucleosome. Where is it found in a cell? **OR** List any four adaptive features evolved in parasitic animals enabling them to live successfully on their hosts.	2
21.	Explain any two devices by which autogamy is prevented in flowering plants.	2
22.	In the given figure, write the name and functions of parts labelled **A** and **B**. 	2

	OR Why are sacred groves highly protected?	
23.	Identify the sex of organism as male or female in which the sex chromosomes are found as; a) ZW in birds b) XY in Drosophila c) ZZ in birds d) XO in grasshopper	2
24.	Mention any four advantages of Genetically Modified Plants.	2
25.	Observe the diagram, and give answer for the following questions.  a) Label the parts A, B and C. b) Which cell produce these chemicals?	2
SECTION C		
26.	How has biotechnology helped in producing *Meloidogyne incognita* resistant tobacco plant? (ii) Why does this nematode die on eating such a GM plant?	3
27.	The following graph represents the organismic response to certain environmental condition (e.g. temperature)	3

	 (i) Which one of these A or B depicts conformers? (ii) What does the other line graph depict? (iii) How do these organisms differ from each other with reference to homeostasis? (iv)Mention the category to which human belong.	
28.	Draw a diagram of a male gametophyte of an angiosperm. Label any four parts. Why is sporopollenin considered the most resistant organic material?	3
29.	A man with AB blood group marries a woman with O blood group. a) Work out all the possible phenotypes and genotypes of the progeny. b) Discuss the kind of domination in parents and progeny in this case.	3
30.	Differentiate between spermatogenesis and oogenesis. **OR** Explain pBR322 with the help of a labeled diagram	3
	SECTION D	
31.	Explain the development of the zygote into an embryo and of the primary endospermic nucleus into an endosperm in a fertilized embryo sac of a dicot plant. **OR** Describe the process of transcription in bacterium with well labeled diagram	5

32.	Describe the life cycle of malarial parasite with the help of a well labelled diagram. **OR** a) Explain the following phases in the menstrual cycle of a human female: i) Menstrual Phase ii) Follicular phase iii) Luteal phase b) "A proper understanding of menstrual cycle can help immensely in family planning". Do you agree with the statement? Provide reason for your answer.	5
33.	In dogs, barking trait is dominant over silent and erect ears are dominant over dropping ears. What is the expected phenotypic and genotypic ratio of offspring when dogs heterozygous for both the traits are crossed? OR a)Explain a mono hybrid cross taking seed coat colour as a trait in *Pisum sativum*. Workout the cross upto F2 generation. b)State the law of inheritance that can be derived from such a cross. c)How is the phenotypic ratio of F2 generation different in a dihybrid cross.	5

Kochi Metro Sahodaya
Model Question Paper
BUSINESS STUDIES

Grade: XII **Time: 3 hrs**
Roll No: **Marks: 80**

General Instructions

- ***This question paper contains 34 questions.***
- ***Marks are indicated against each question.***
- ***Answer should be brief and to the point.***
- ***Answers to the questions carrying 3 marks may be from 50 to 75 words.***
- ***Answers to the questions carrying 4 marks may be about 150 words.***
- ***Answers to the questions carrying 6 marks may be about 200 words.***
- ***Attempt all parts of the questions together.***

1. Abhijeet is doing CA. He wants to do some training under some coach as to acquire real world knowledge and skills. He has two mentors with him. One mentor is from the college and the other is from the company. The idea is to give real knowledge about the corporate functioning. Identify the type of training involved: **1**
    a. Apprenticeship Programme
    b. Internship training
    c. Vestibule training
    d. None of these
2. In Rathi Steel Company the employees do the quality analysis in a neutral and fair manner. They are applying different techniques for achieving this aim. Some of these are personal observation, sample checking, etc. They are also keeping the units of measurement same to that of the units of set standards. Identify the step of controlling: **1**
    a. Taking corrective action
    b. Measurement of actual performance
    c. Comparing actual and standard performance
    d. Analyzing deviations
3. It is a money market instrument whose maturity period may range from a fortnight to a year **1**
    a. Call money
    b. Commercial paper
    c. Treasury bill
    d. Commercial bill
4. Which right states that a consumer has a right to get information while buying any good or service? **1**
    a. Right to safety
    b. Right to be informed
    c. Right to be heard
    d. Right to seek redressal

5. _____is the process of giving a product distinct individuality
    a. Packing
    b. Labeling
    c. Pricing
    d. Branding
6. Naveen started a saree showroom in Mumbai, India. He wants to sell sarees in France but he understands that conditions are different in different countries. Identify the feature of business environment highlighted here : **1**
    a. Relativity
    b. Uncertainty
    c. Dynamic nature
    d. Complexity
7. Sushant runs a software company. Now he wants to open a retail company. The size of organization is large and there is a need for higher degree of specialization. Identify the organizational structure here: **1**
    a. Divisional structure
    b. Functional structure
    c. Both (a) and (b)
    d. None of these
8. Answerability of the subordinate about the final result of the assigned task. Identify the element of delegation. **1**
    a. Authority
    b. Accountability
    c. Responsibility
    d. None of these
9. Arun wants to start a TV manufacturing company. He has decided to make a blueprint for the amount of production it will do, the efforts behind promotion it will put and all other major actions it will undertake to achieve its objectives. Identify the function of marketing management. **1**
    a. Gathering and analyzing market information
    b. Marketing planning
    c. Transportation
    d. Warehousing
10. Beauty Women is a leading cosmetic company which sells variety of products such as kajal, lipsticks, eyeliner etc. Identify the ingredients of marketing mix. **1**
    a. Price
    b. Place
    c. Product
    d. Promotion
11. The proportion of debt in the overall capital is called financial leverage. Identify the concept.
    a. Capital structure **1**
    b. Financial leverage
    c. Return on investment
    d. Trading on equity

OR

Kamini runs a designer boutique in Gurgaon. She's doing well in terms of profits. She wants to open branches in different parts of India. Identify the type of decision:

a. Financing decision
b. Investment decision
c. Dividend decision
d. None of these

12. On the eve of Diwali, Fashion Diva Ltd. decided to clear its stock. The company has a huge pile of clothes to be cleared across its various branches. The company has decided to give discount on its products. It even has decided to go for various fashion shows in different colleges. It has also decided to sponsor a few events. However, people say that the clothes are not much of current fashion and the company is not considering the choice of the customers. Identify the marketing concept : **1**

a. Production concept
b. Product concept
c. Societal marketing concept
d. Selling concept

OR

Match the following:

	Column I		Column II
A	Production orientation	(i)	Relationship between benefits and the sacrifice
B	Customer value	(ii)	Marketing management philosophy
C	Customer satisfaction	(iii)	Fundamental objective of most businesses
D	Survival, profits, and growth	(iv)	Grading
E	Product sorting	(v)	Value-based price are met or exceeded

a. (ii), (i), (v), (iii), (iv)
b. (iv), (ii), (iii), (i), (v)
c. (i), (ii), (iii), (iv), (v)
d. (v), (i), (ii), (iv), (iii)

Read the following text and answer question no.13 to 16 on the basis of the same:

Over the years, e-business is growing as there is significant improvement in the Information Technology infrastructure over the last decade. For that Government has taken important steps in high-speed Internet connectivity. As a result, the broadband networks have not only become better but also more affordable. Additionally, Government is trying to make rural India connected through broadband – a great possibility for e-business to expand the retail market by reaching out to the most remote rural customer. Another catalyst strengthening the e-business segment is the country's favourable demography. It has more than 50% of its population below the age of 25 and more than 65% below the age of 35. It is expected that, in the year 2020, the average age of an Indian will be 29 years, compared to 37 for China and 48 for Japan, this promises for phenomenal increase in e-business. Moreover, the penetration of the smartphone in a large section of the population has aptly addressed the problem of compute illiteracy. Not withstanding the fact that consumers also prefer e-business due to multiple factors like convenience, time etc.

13. "For that Government has taken important steps in high-speed Internet connectivity." Identify the dimension of Business Environment. **1**
    a. Political Environment
    b. Legal Environment
    c. Both (a) and (b)
    d. None of these
14. The various legislations passed by the Government administrative orders issued by government authorities, court judgments as well as the decisions rendered by various commissions and agencies at every level of the government— center, state or local comes under which dimension of business environment. **1**
    a. Political Environment
    b. Legal Environment
    c. Both (a) and (b)
    d. None of these
15. "Over the years, e-business is growing as there is significant improvement in the Information Technology infrastructure over the last decade." Identify the dimension of Business Environment. **1**
    a. Technological Environment
    b. Political Environment
    c. Economic Environment
    d. None of these
16. "Another catalyst strengthening the e-business segment is the country's favorable demography. It has more than 50% of its population below the age of 25 and more than 65% below the age of 35." Identify the dimension of Business Environment. **1**
    a. Political Environment
    b. Social Environment
    c. Economic Environment
    d. None of these

Read the following text and answer question no.17 to 16 on the basis of the same:

Krishna and Saroj are both qualified CA and good friends. After obtaining a certificate of practice, they decide to pursue a career of their own choice. Krishna starts own practice in the city whereas Saroj joins a Government Company. They meet after a long time in a party. Krishna invites Saroj to visit his office and she accepts his invitation. She observes at his office that there is a fixed place for everything and everyone and it is present there so that there is no hindrance in the activities of the office. Also, Krishna always tends to replace 'I' with 'We' in all his conversations with the staff members. Later on Krishna shares with her that he always deals with lazy staff sternly to send the message that everyone is equal in his eyes.

17. Whether Management is _____ profession. **1**
    a. Full fledged
    b. Soon going to be
    c. Not
    d. None of these

18. "Krishna shares with her that he always deals with lazy staff sternly to send the message that everyone is equal in his eyes". Identify the management principle. **1**
    a. Equity
    b. Subordination of Individual interest to general interest
    c. Scalar Chain
    d. None of these
19. "Krishna always tends to replace 'i' with 'We' in all his conversations with the staff members". Which principle of Management is being highlighted here? **1**
    a. Stability of Personnel
    b. Equity
    c. Espirit de Corps
    d. None of these
20. "She observes at his office that there is a fixed place for everything and everyone" Identify the Principle of Management highlighted here. **1**
    a. Equity
    b. Order
    c. Espirit De Corps
    d. Unity of Command
21. Explain various steps in process of controlling? **3**
22. Write process of staffing after a candidate gets selected. **3**
23. Explain work study as a technique of management. **3**

    OR

    Write significance of Principles of Management.
24. Mohit is working as a production manager in a MNC which produces steel bottles. He set target 80 units per day. Recently he noticed that his team could not achieve the target production of 80 units per day. Instead on an average the production touched the target of only 65 units. On thorough analysis, he found out that the deviation between standard production and actual production is far beyond acceptable range, on overall analysis he also found out that there has been a marginal increase in office stationery expenses. Moreover, he detected that the machine installed for the purpose of manufacturing was not able to perform at its best. Being a management expert suggest Mohit how he should deal with the existing problem. **3**
25. Lokesh and litesh are two friends. They started a business of making affordable housing societies named as Ashiyana homes for underprivileged people. People invested ` 3000 crore into this project. Later on, it was discovered that they it was an illegal business and conducted various fraudulent activities in the company. The SEBI has imposed a penalty of ` 400 crores on Ashiyana Homes Ltd. While imposing the penalty, the biggest in its history, Securities and Exchange Board of India (SEBI) said the company deserved "maximum penalty" for duping the common man. Its Prevention of Fraudulent and Unfair Trade Practices Regulations provides for "severe to severe penalties" for dealing with such violations. As per SEBI norms, it can impose a penalty of ` 25 crore or three times of the profit made by indulging in fraudulent and unfair trade practices and in the present case, the regulator has imposed a fine equivalent to three times of the illicit gains. In the context of the above case:
    (a) State the objectives of setting up SEBI.
    (b) Identify the type of function performed by SEBI by quoting lines from the paragraph. **4**
26. Explain any three points of importance of planning function of management. **4**

27. Explain the importance of planning. **4**

OR

Write features of planning.

28. Manan runs a medicine manufacturing company. The company chose to diversify its operations to improve its growth potential and increase market share. As the project was important, many alternatives were generated for the purpose and were thoroughly discussed amongst the members of the organization. After evaluating the various alternatives, Mohan, the Managing Director of the company, decided that they should add "cosmetics" as a new line of business activity.

(a) Name the framework, which the diversified organization should adopt, to enable it to cope with the emerging complexity? Give one reason in support of your answer.

(b) State any two limitations of this framework. **4**

OR

What do you mean by management? Write characteristics and objectives of management.

29. Why is coordination treated as an essence of management? **4**

30. These days, the development of the country is also judged by its system of transferring finance from the sector where it is in surplus to the sector were it is needed the most. To give strength to the economy, SEBI is undertaking measures to develop the capital market. In addition to this, there is another market in which unsecured and short-term debt instrument are actively traded every day. These markets together help the savers and investors in directing the available fund into their most productive investment opportunity.

    a. Name the function being performed by the market in the above case.
    b. Name the market segment other than the capital market in which short term debt instruments is traded. Also give any three points of difference between the two. **4**

31. An important difference between A&B Ltd. and most other companies is that instead of operating as one large corporation it operates as 180 smaller companies each focused on a specific product and area, implying selective dispersal of authority, recognising the decision makers need for autonomy, as decision making authority is pushed down the chain of command. It enables the company to maintain short lines of communication with customers and employees, and accelerate the development of talent. Identify the philosophy that is being followed by A&B Ltd. through which it is dividing the decision-making responsibilities among the hierarchical levels. State any five points of importance of the philosophy identified. **6**

32. Seema runs a utensils manufacturing company. She earned ` 500 crore out of this business. She doesn't know how to appropriate these profits. Discuss any five factors which will help him in taking this decision. **6**

OR

Hemant, a businessman, is engaged in the purchase and sale of bread. Identify his working capital requirements by giving reasons to support your answer. Now, he is keen to start his own bread factory. Explain any two factors that will affect his fixed capital requirements.

33. Star technologies are a design company which designs websites and mobile phone application. The company does mass recruitment each year from different colleges offering fresher level job to the final year students. This helps in recruiting the brightest and the best available talent in the educational institutions In context of the above case :

(a) Identify the source of external recruitment adopted by the company.

(b) Explain briefly any three advantages of using the external sources of recruitment. **6**

34. Explain any three rights of consumer under Consumer Protection Act 1986. **6**

KOCHI METRO SAHODAYA
AISSCE MODEL EXAMINATION CLASS - XII (2020-2021)
CHEMISTRY (043)

Time: 3 Hours **Maximum Marks: 70**

GENERAL INSTRUCTIONS.

Read the following instructions carefully.

a) There are 33 questions in this question paper. All questions are compulsory.

b) Section A: Q. No. 1 to 2 are case-based questions having four MCQs or Reason Assertion type based on given passage each carrying 1 mark.

c) Section A: Question 3 to 16 are MCQs and Reason- Assertion type questions carrying 1 mark each.

d) Section B: Q. No. 17 to 25 are short answer questions and carry 2 marks each.

e) Section C: Q. No. 26 to 30 are short answer questions and carry 3 marks each.

f) Section D: Q. No. 31 to 33 are long answer questions carrying 5 marks each.

g) There is no overall choice. However, internal choices have been provided.

h) Use of calculators and log tables is not permitted.

SECTION A (OBJECTIVE TYPE)

1. Read the passage given below and answer the following questions: (1x4=4)

Primary and secondary alcohols are dehydrogenated by Copper at 573K to aldehydes and ketones respectively. In contrast, tertiary alcohols are dehydrated to alkenes by heating with Cu at 573K. Similarly primary alcohols are easily oxidised to form first an aldehyde and then a carboxylic acid,while secondary alcohols are oxidised to ketones which are further oxidised to form a mixture of carboxylic acids. Tertiary alcohols are oxidised with difficulty and with strong oxidising agents in acidic medium. They form first ketones and then acids. In the case of alcohols containing C=C double bond , some oxidising agents oxidise both double bond and –OH group while other reagents do not affect C=C double bond.

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) Acidified $KMnO_4$ will convert:

a) Propan-1-ol to Propanal

b) Propan-2-ol to Propanal

c) Ethanol to Ethanoic acid

d) Ethanol to Ethanal

(ii) Butan-2-ol on reaction with anhydrous CrO_3 gives:

a) But-1-ene

b) But-2-ene

c) Butanal

d) Butan-2-one

OR

Which of the following is a primary allylic alcohol?

a) But-3-en-2-ol

b) But-2-en-2-ol

c) Prop-2-enol

d) Butan-2-ol

(iii) The oxidizing agent which oxidises a primary alcohol to aldehyde without affecting C=C double bond is:

a) PCC

b) Acidic $KMnO_4$

c) Alkaline $K_2Cr_2O_7$

d) $NaBH_4$

(iv) An organic compound 'P' with molecular formula $C_4H_{10}O$ on reaction with Copper at 573K gives compound 'Q' which does not reduce Tollen's or Fehling's reagent. Q when treated with Sodium hypoiodite gives a yellow precipitate. 'Q' on reaction with Zn amalgam and Conc.HCl gives 'R' . Compounds 'P', 'Q' and 'R' respectively are

a) Butan-1-ol, Butanal , Butane

b) Butan-2-ol , Butan-2-one , Butane

c) 2-Methylpropan-1-ol , 2-Methylpropanal ,2-Methylpropane

d) 2-Methylpropan-2-ol , Propanone , Propane

2. Read the passage given below and answer the following questions: (1x4=4)

Proteins are high molecular mass complex biomolecules of amino acids. Except for glycine, all alpha amino acids have chiral carbon atom and have L-configuration. The amino acids exist as dipolar ion called zwitter ion, in which a proton goes from the carboxyl group to the amino group. A large number of alpha amino acids are joined by peptide bonds forming polypeptides. The polypeptides having very large molecular mass(more than 10,000) are called proteins. The structure of proteins is described as primary structure giving sequence of linking of amino acids; secondary structure giving the manner in which the polypeptide chains are arranged and folded; tertiary structure giving folding, coiling or bonding polypeptide chains producing 3D structures and quaternary structure giving arrangement of sub-units in an aggregate protein molecule.

2. In the following questions , a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) Assertion is wrong statement but reason is correct statement.

(i) Assertion: All proteins on hydrolysis gives alpha amino acids.

Reason: Proteins are polymers of alpha amino acids.

(ii) Assertion: Except glycine, all naturally occurring amino acids are optically active.

Reason: All naturally occurring amino acids except glycine have at least one asymmetric carbon atom.

(iii) Assertion: Insulin is a globular protein.

Reason: In insulin, the polypeptide chains run parallel and it has a fibre-like structure.

(iv) Assertion: When ten or more amino acid molecules combine through peptide linkage, proteins are formed.

Reason: In proteins, amino acid molecules are joined through peptide bonds eliminating water molecules.

OR

Assertion: Primary structure of a protein is unique.

Reason: Proteins are composed of only one type of amino acids.

Following questions (No. 3 -11) are multiple choice questions carrying 1 mark each:

3. $\wedge^{o}_{m}(NH_4OH)$ is equal to:

a) $\wedge^{o}_{m}(NaOH) + \wedge^{o}_{m}(NH_4Cl) - \wedge^{o}_{m}(HCl)$

b) $\wedge^{o}_{m}(NH_4Cl) + \wedge^{o}_{m}(NaOH) - \wedge^{o}_{m}(NaCl)$

c) $\wedge^{o}_{m}(NH_4Cl) + \wedge^{o}_{m}(NaCl) - \wedge^{o}_{m}(NaOH)$

d) $\wedge^{o}_{m}(NaOH) + \wedge^{o}_{m}(NaCl) - \wedge^{o}_{m}(NH_4Cl)$

4. Which of the following is a disaccharide?

a) Glucose
b) Starch
c) Cellulose
d) lactose

OR

Which of the following is not present in DNA?

a) Adenine
b) Guanine
c) Uracil
d) Thymine

5. On dissolving sugar in water at room temperature, solution feels cool to touch. Under which of the following cases , dissolution of sugar will be most rapid?

a) Sugar crystals in cold water
b) Sugar crystals in hot water
c) Powdered sugar in hot water
d) Powdered sugar in cold water

6. The number of unpaired electrons in gaseous species of Mn^{3+} , Cr^{3+} and V^{3+} respectively are…and most stable species is….

a) 4,3 and 2 and V^{3+} is most stable
b) 3,3 and 2 and Cr^{3+} is most stable
c) 4,3 and 2 and Cr^{3+} is most stable
d) 3,3 and 2 and Mn^{3+} is most stable

(Atomic numbers of Mn , Cr and V are 25, 24 and 23 respectively)

OR

A transition metal exists in its highest oxidation state. It is expected to behave as

a) A chelating agent
b) A central metal in a coordination compound
c) An oxidizing agent
d) A reducing agent

7. Which among the following compound will give an offensive compound when heated with chloroform and alcoholic KOH?

a) CH_3CN
b) $C_2H_5NH_2$
c) $(CH_3)_3N$
d) $C_2H_5CONH_2$

OR

Out of the following compounds, which is the most basic in aqueous solution?

a) CH_3NH_2
b) $(CH_3)_2NH$

c) NH_3

d) $C_6H_5NH_2$

8. When 1 mol $CrCl_3.6H2O$ is treated with excess of $AgNO_3$, 2 mol of AgCl are precipitated. The formula of the complex is:

a) $[Cr(H_2O)_3Cl_3]\ .3H_2O$

b) $[Cr(H_2O)_4Cl_2]Cl\ .2H_2O$

c) $[Cr(H_2O)_5Cl]\ Cl_2\ .H_2O$

d) $[Cr(H_2O)_6]Cl_3$

OR

The IUPAC name of the following coordination compound is:

$[Co(NH_3)_2(H_2O)_2Cl(ONO)]Cl$

a) Diaquadiamminechloridonitrito-N-cobalt(III) chloride

b) Diamminediaquachloridonitrito-O-cobalt(II) chloride

c) Diamminediaquachloridonitrito-O-cobalt(III) chloride

d) Diaquadiamminechloridonitrito-N-cobalt(III) chloride

9. Out of $[TiF_6]^{2-}$, $[CoF_6]^{3-}$, Cu_2Cl_2 and $[NiCl_4]^{2-}$, the colourless species are (Atomic number of Ti = 22, Co=27, Ni= 28, Cu = 29)

a) Cu_2Cl_2 and$[\ NiCl_4]^{2-}$

b) $[TiF_6]^{2-}$ and Cu_2Cl_2

c) $[CoF_6]^{3-}$ and $[NiCl_4]^{2-}$

d) $[TiF_6]^{2-}$ and $[CoF_6]^{3-}$

10. Identify X,Y and Z:

$$CH3\ CH(Br)\ CH3 \xrightarrow{Alc.KOH} X \xrightarrow{HBr/peroxide} Y \xrightarrow{NaI/acetone} Z$$

a) X = $CH_3\ CH(OH)\ CH_3$, Y= $CH_3\ CH(OH)CH_2Br$, Z= $CH_3\ CH(OH)CH_2I$

b) X = $CH_3\ CH{=}\ CH_2$, Y= $CH_3\ CH_2\ CH_2Br$, Z= $CH_3\ CH_2\ CH_2I$

c) X = $CH_3\ CH{=}\ CH_2$, Y= $CH_3\ CH(Br)\ CH_3$, Z= $CH_3\ CH(I)\ CH_3$

d) X = $CH_3\ CH(OH)\ CH_3$, Y= $CH_3\ CH(Br)(OH)CH_3$, Z= $CH_3\ CH(I)(OH)CH_3$

11. Iodine molecules are held in the crystal lattice by……

a) London forces
b) Dipole-dipole interactions
c) Coulombic forces
d) Covalent bonds

In the following questions (Q. No. 12 - 16) a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c) Assertion is correct statement but reason is wrong statement.
d) Assertion is wrong statement but reason is correct statement.

12. Assertion: Coagulation power of Al^{3+} is more than Na^{+}.
Reason: Greater the valency of the flocculating ion added, greater is its power to cause precipitation.

13. Assertion: F-F bond in F_2 molecule is weaker than Cl-Cl bond in Cl_2.
Reason: F is more electronegative than Cl.

14. Assertion: Addition of a non-volatile solute to a volatile solvent increases its boiling point.
Reason: Addition of a non-volatile solute increases the vapour pressure of the solution.

OR

Assertion: If Red Blood Cells were removed from the body and placed in pure water, the pressure inside the cells increases.
Reason: Concentration of salt content in the cells increases.

15. Assertion: Phenol is more acidic than p-nitrophenol.
Reason: Nitro group at ortho and para position stabilizes the phenoxide ion by dispersal of negative charge due to resonance.

16. Assertion: Bond angle in ethers is slightly less than the tetrahedral angle.
Reason: There is repulsion between the two buky alkyl groups in ethers.

SECTION B

The following questions, Q.No 17 – 25 are short answer type and carry 2 marks each.

17. Although chlorine is an electron withdrawing group, yet it is ortho-,para-directing group in electrophilic aromatic substituition reactions. Explain why?

OR

Carry out the following conversions in not more than 2 steps:

(i) Ethane to Butane

(ii) Bromobenzene to Toluene

18. 45g of ethylene glycol($C_2H_6O_2$) is mixed with 600g of water. Calculate freezing point depression and freezing point of the solution. K_f for water =1.86 K kg mol^{-1}.
Atomic masses:C=12g, H=1g , O=16g

19. Write the oxidation state and d-orbital occupation of the central metal ion in the following complex and predict its geometry and magnetic behavior.

$(NH_4)_2[CoF_4]$

OR

$[NiCl_4]^{2-}$ is paramagnetic while $[Ni(CO)_4]$ is diamagnetic though both are tetrahedral. Expain.

20. Define half life period of a reaction. Show that half life of a first order reaction is independent of initial reactant concentration.

OR

For a reaction A + 2B → C, the reaction rate is doubled when the concentration of A is doubled. The rate is increased by four times when the concentration of both A and B are increased four times.

i) Write the rate law of the reaction

ii)Determine the order of the reaction.

21. A first order reaction takes 30 minutes for 50% completion. Calculate the time required for 90% completion of this reaction.

22. Write the mechanism of the reaction of HI with Methoxymethane:

$CH_3\text{-}O\text{-}CH_3 + HI \rightarrow CH_3OH + CH_3I$

23. Discuss the molecular shape of BrF_3 on the basis of VSEPR theory.

24. State Zaitsev rule and predict all the alkenes that would be formed by dehydrohalogenation of following haloalkane with sodium ethoxide in ethanol . Identify the major alkene.

2-Chloro-2-methylbutane

25. What type of defect can arise when a crystal is heated? Which physical property is affected by it and in what way?

SECTION C

Q.No 26 -30 are Short Answer Type II carrying 3 mark each.

26. Give reasons for the following:

i. Zr and Hf exhibit similar properties.

ii. Cuprous chloride (CuCl) is colourless while cupric chloride($CuCl_2$) is blue.

iii. Iron has higher melting point than Cu.

OR

Observed and calculated values for the standard electrode potentials($E^o_{M^{2+}/M}$) of elements from Ti to Zn in the first transition series are depicted in figure (1):

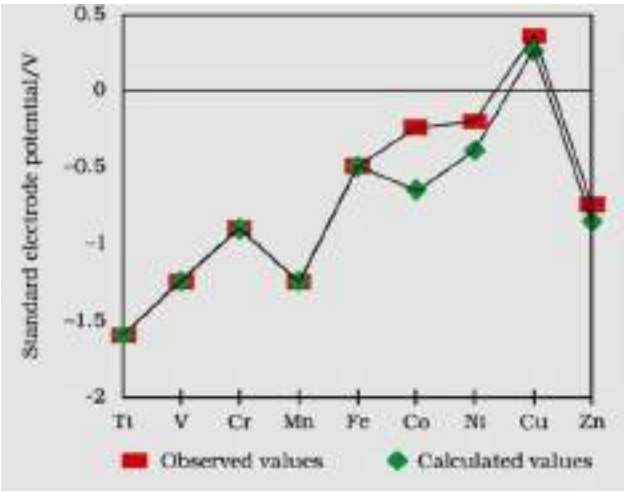


FIGURE 1

Answer the following questions:

i. Describe the trend in the variation of standard electrode potentials($E^o_{M^{2+}/M}$) of elements in 3d series.

ii. Copper cannot displace H_2 from acids. Why?

iii. E^o values of Mn and Zn are more negative than expected, why?

27. Give explanation for each of the following:

i. Why cannot aromatic primary amines be prepared by Gabriel Phthalimide synthesis?

ii. Why do primary amines have higher boiling point than tertiary amines?

iii. Why are aliphatic amines stronger bases than aromatic amines?

28. An element crytallises into a structure which may be described by a cubic type of unit cell having one atom on each corner of the cube and two atoms on one of its body diagonals. If the volume of this unit cell is $24x10^{-24}$ cm^3 and density of the element is 7.2 g cm^{-3}, calculate the number of atoms present in 200g of the element.

29. How are the following colloids different from each other in respect of dispersion medium and dispersed phase. Give one example of each type.

i. Aerosol

ii. Hydrosol

iii. emulsion

30. i. Draw the structure of:

XeF_4 , IF_7

ii. Of all the noble gases, only Xe and Kr are known to form compounds, why?

iii. Among the hydrides of group 17 elements(HX) ,which is most acidic? Why?

SECTION D

Q.No 31 to 33 are long answer type carrying 5 marks each.

31. An inorganic salt of sodium (A) gave golden yellow flame on performing flame test. It also gave the following tests:

i) When heated with conc.H_2SO_4, (A) gave a pungent smelling gas (B) which is highly soluble in water. When $AgNO_3$ solution is added to the aqueous solution of gas (B) , it gave a white curdy ppt soluble in NH_4OH.

ii) When salt (A) was heated with MnO_2 and conc.H_2SO_4, a pungent smelling greenish-yellow gas (C) was obtained.

iii) When gas (C) was passed through KI solution, a violet solid (D) was obtained . Identify the compounds A,B,C and D and explain all the reactions involved there in giving equations.

OR

a) Arrange the following in the increasing order of property indicated: **(2+3)**

i. H_2O , H_2S, H_2Se, H_2Te (acidic strength)

ii. NH_3, PH_3, AsH_3, SbH_3 , BiH_3 (basic strength)

b) A pale blue gas (X) is used as a disinfectant and as a germicide for sterilizing water. It converts black lead sulphide to a colourless substance (Y). Identify gas (X) and the colourless substance (Y).Write the chemical equation of the reaction between X and Y.

32. An organic compound 'A'(molecular formula C_7H_6O), which has a characteristic odour , on treatment with dil. NaOH forms two compounds (B) and (C). Compound (B) has the molecular formula C_7H_8O which on oxidation gives back (A). Compound (C) is the sodium salt of an acid. (C) when heated with sodalime yields an aromatic hydrocarbon (D). Deduce the structures of A, B, C and D. Give the chemical reactions involved. **(5)**

OR

(i) Write a chemical reaction to exemplify:

a) Clemmenson reduction

b) Hell-Volhard-Zelinsky reaction

(ii) How will you carry out the following conversions:
Methyl bromide to Ethanoic acid

(iii)Give a chemical test to distinguish between the following compounds:

a) Ethanal and Propanal

b) Phenol and Benzyl alcohol

33. (i) The std emf of the cell reaction , $3Sn^{4+} + 2Cr \rightarrow 3Sn^{2+} + 2Cr^{3+}$ is 0.89V. Calculate ΔG^o for the reaction. ($1F = 96{,}500\ Cmol^{-1}$) **(2+3)**

(ii) For a Galvanic cell:

$Cd(s) \mid Cd^{2+}(0.10M) \mid\mid H^+(0.20M) \mid Pt, H_2(0.5atm)$

(Given $E^o_{Cd^{2+}|Cd} = -0.403V$)

a. Write the cell reaction

b. Determine the cell potential.

OR

(i) Calculate molar conductivity at infinite dilution of AgCl from the following data:
$\wedge^o_m(AgNO_3)=133.4$, $\wedge^o_m(KCl)=149.9$, $\wedge^o_m(KNO_3) = 144.9\ S\ cm^2\ mol^{-1}$. **(2+1+2)**

(ii) Predict if the reaction between the following is feasible or not:
Ag (s)and Fe^{3+} (aq)
Given Standard electrode potentials: $E^o_{Ag^+|Ag} = +0.80V$, $E^o_{Fe^{3+}|Fe^{2+}} = +0.77V$

(iii) Predict the products of electrolysis of an aqueous solution of $AgNO_3$ with silver electrodes.

KOCHI METRO SAHODHYA MODEL QUESTION PAPER 2020-21

CHEMISTRY THEORY – (043)

Std:XII **MARKS: 70**

TIME: 3 hours

General Instructions:

a) **There are 33 questions in the question paper. All questions are compulsory.**
b) **Section A: Q. No. 1 to 2 are case-based questions having four MCQ's or Reason-Assertion type based on given passage and each carry 1 mark.**
c) **Section A: Question 3 to 16 are MCQ's and Reason- Assertion type questions carrying 1 mark each.**
d) **Section B: Q. No. 17 to 25 are short answer questions and carry 2 marks each.**
e) **Section C: Q. No. 26 to 30 are short answer questions and carry 3 marks each.**
f) **Section D: Q. No. 31 to 33 are long answer questions carrying 5 marks each.**
g) **There is no overall choice. However, internal choices have been provided.**
h) **Use of calculators and log table is not permitted.**

SECTION A (OBJECTIVE TYPE)

1. **Read the passage given below and answer the following questions:**

Ethers are a class of organic compounds characterized by an oxygen atom bonded to two alkyl or aryl groups and are obtained by replacing both hydrogen atoms from water molecule are replaced by an alkyl or aryl groups. They may be prepared by (i) dehydration of alcohols and (ii) Williamson synthesis. By a proper choice of reagents, both symmetrical and unsymmetrical ethers can be prepared by Williamson's synthesis which involves the reaction between an alkyl halide and an alkoxide ion. The reverse process involving the cleavage of ethers to give back the original alkyl halide and the alcohol can be carried out by heating the ether with HI at 373K. The boiling points of ethers resemble those of alkanes while their solubility is comparable to those of alcohols having same molecular mass. The C-O bond in ethers can be cleaved by hydrogen halides.

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) Allyl phenyl ether can be prepared by heating

a) C_6H_5Br + CH_2=CH-CH_2-ONa b) CH_2=CH-CH_2-Br + C_6H_5-ONa

c) C_6H_5-CH=CH-Br + CH_3-ONa d) CH_2=CH-Br + C_6H_5-CH_2 –ONa

(ii) Benzyl ethyl ether reacts with HI to form

a) p-Iodo toluene and ethyl alcohol b) Benzyl alcohol and ethyl iodide

c) Benzyl iodide and ethyl alcohol d) Iodobenzene and ethyl alcohol

(iii) Which of the following have highest boiling point?

a) Ethane b) Methoxy methane

b) c) Ethanol d) Ethanal

(iv) Which of the following ethers is not cleaved by HI?

a) Dicyclohexyl ether b) Phenetole

c) Di-tert-butyl ether d) Diphenyl ether

2. Read the passage given below and answer the following questions: (1x4=4)

Colloids are heterogeneous mixtures in which microscopically dispersed insoluble particles of one substance are suspended in another substance. The size of the suspended particles in a colloid can range from 1 to 1000 nm..Earlier the term 'Colloid' was used for a category of substances. However,later, the term colloidal state of matter was preferred. Colloidal dispersion have been classified into different types depending upon the physical state of the dispersed phase and the dispersion medium or nature of the colloidal particles. They are prepared in the industry or in the laboratory by a number of methods and then purified. Their properties have also been studied in detail. Hardy-Schulze made a substantial contribution in studying the coagulation of the colloids. The protective action of lyophilic colloids are studied by Zsigmondy and he introduced the term called 'GOLD NUMBER.'

In these questions a statement of assertion followed by a statement of reason is given.

Choose the correct answer out of the following choices.

a) **Both Assertion and Reason are correct and reason is correct explanation for assertion.**
b) **Both Assertion and Reason are correct and reason is not correct explanation for assertion.**
c) **Assertion is correct but reason is incorrect.**
d) **Assertion is incorrect but reason is correct.**

i) Assertion: An ordinary filter paper impregnated with collodion solution stops the flow of colloidal particles.

Reason: Pore size of the filter paper becomes more than the size of colloidal particle.

ii) Assertion: Lyophilic sol is more stable than lyophobic sol.

Reason: Lyophilic sol has greater solvation energy than lyophobic sol.

iii) Assertion: Colloidal gold sol is red in colour.

Reason: The colour arises due to scattering of light by the colloidal gold particles.

iv) Assertion: Fe^{3+} can be used for the coagulation of As_2S_3 sol.

Reason: Fe^{3+} ion reacts with As_2S_3 to give Fe_2S_3.

OR

Assertion: Colloidal sols are stable but colloidal particles do not settle down.

Reason: Brownian movement counters the force of gravity actively on colloidal particles.

Following questions (No. 3-11) are multiple choice questions carrying 1 mark each.

3. If the standard electrode potential of an electrode is greater than zero, then we infer that its

a). Reduced form is more stable compared to Hydrogen gas

b). Oxidised form is more stable compared to hydrogen gas

c). Reduced and oxidized forms are equally stable

d). Reduced form is less stable than the hydrogen gas

4. Which of the following is a disaccharide?

a) Starch b) Maltose c) Fructose d) glucose

OR

During denaturation of protein, which of the following structure remains intact?

a) Secondary b) Primary c) Tertiary d) Quaternary

5. 50ml of an aqueous solution of glucose of molar mass 180 gm/mol contains 6.02×10^{22} molecules.

The concentration of the solution will be

a). 0.1M b) 0.2M c) 1.0M d) 2.0M

6. Total number of unpaired electrons present in Co^{3+} (Atomic number =27) is

a). 2 b) 4 c) 3 d) 5

OR

Out of the following transition elements, the maximum number of oxidation states are shown by

a). Sc (Z=21) b) Cr(Z=24) c) Mn (Z=25) d) Fe (Z=26)

7. Out of the following, strongest base in aqueous solution is

a). Methylamine b) Dimethylamine c) Trimethylamine d) Aniline

OR

Which of the following cannot be prepared by Gabriel Phthalimide synthesis?

a). Methyl amine b) Benzyl amine c) Aniline d) Propan-1-amine

8. The oxidation state of Ni in $[Ni(CO)_4]$ is

a). 0 b) 2 c)3 d) 4

9. Pick out the coloured ion from the following?

a). Cu^+ b) Fe^{2+} c) Zn^{2+} d) Sc^{3+}

10. Copper crystallises in a fcc lattice with unit cell length of 361pm. Then the radius of copper

atom is

a). 157pm b) 181pm c) 108pm d) 128pm

11. Racemization occurs in

a) SN^1 reaction b) SN^2 reaction

c) Neither SN^1 nor SN^2 reaction d) SN^2 reaction as well as SN^1 reaction

In the following questions (Q.No.12-16) a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

a) **Assertion and reason both are correct statements and reason is the correct explanation for assertion.**

b) **Assertion and reason both are correct statements but reason is not correct explanation for assertion.**

c) **Assertion is a correct statement but reason is wrong statement.**

d) **Assertion is wrong statement but reason is correct statement.**

12. Assertion: Sucrose is a non- reducing sugar.

Reason: Sucrose has glycosidic linkage.

13. Assertion: F-F bond in F_2 molecule is weak.

Reason: F-atom is small in size.

14. Assertion: Osmotic pressure is a colligative property.

Reason: Osmotic pressure is directly proportional to molarity.

OR

Assertion: 0.1M solution of KCl has greater osmotic pressure than 0.1M solution of glucose solution at same temperature.

Reason: In solution, KCl dissociates to produce more number of particles.

15. Assertion: o-Nitrophenol is a weaker acid than p-nitrophenol.

Reason: Intramolecular hydrogen bonding makes ortho isomer weaker than para isomer.

16. Assertion: t-Butyl methyl ether is not prepared by the reaction of t-butyl bromide with sodium methoxide.

Reason: Sodium methoxide is a strong nucleophile.

SECTION B

The following questions, Q.No.17-25 are short answer type and carry 2 marks each.

17. a) Among 3-Bromo pentane and 2-Bromobutane which molecule is chiral?

b) Identify the major product formed when Bromobenzene is treated with

i) Mg/dry ether ii) Na/dry ether.

OR

How would you carry out conversions in not more than 2 steps:

a) Ethanol to propane nitrile b) But-1-ene to 1-Iodobutane

18. An antifreeze solution is prepared by dissolving 31g of ethylene glycol (Molar mass=62g/mol) in 600g of water. Calculate the freezing point of the solution. (K_f for water= 1.86Kkg/mol)

19. a) Write the IUPAC name of the complex $K_4[Mn(CN)_6]$

b) What is meant by Chelate effect? Give an example.

OR

a) Predict the geometry of the complex $[NiCl_4]^{2-}$ and $[NiCN_4]^{2-}$

20. a) A reaction is first order w.r.t. reactant A as well as w.r.t. reactant B. Give the rate law.

b) Write the main difference between average rate and instantaneous rate.

21. A first order reaction is 25% completed in 40 minutes. Calculate the value of rate constant. In what time will the reaction be 80% completed?

22. Propose the mechanism of conversion of ethene to ethanol.

23. Draw the shapes of a) $XeOF_4$ b) BrF_3

24. What happens when (Write only equation)

a) n-Butyl chloride is treated with alcoholic KOH

b) Methyl bromide is treated with alcoholic KCN

25. Calculate the packing efficiency in case of a metal crystal for body centered cubic

SECTION C

Q.No. 26-30 carry Answer Type II carrying 3 mark each.

26. Account for the following:

a) Copper (I) compounds are white whereas copper (II) compounds are coloured.

b) Transition element can act as catalyst.

c) Zn, Cd and Hg are considered as d-block elements but not as transition elements.

OR

What is Lanthanoid Contraction? Write its cause and consequences.

27. a) How will you distinguish between the following pairs of compounds:

i) Aniline and Ethanamine ii) N-Methylaniline and Aniline

b) Arrange Butanol, Butanamine and Butane in the decreasing order of their boiling points.

OR

Convert the following:

a) Ethanoic acid to methanamine

b) Nitrobenzene to Benzene diazonium chloride

c) Benzene diazonium chloride to Benzoic acid

28. Silver crystallizes in fcc lattice. If edge length of the cell is 407pm and density is 10.5g/cc,

Calculate the atomic mass of silver.

29. a) Give the explanation for the following:

i) Glucose does not give 2,4DNP test.

ii) Two strands in DNA are not identical but are complementary.

b) What is the difference between Nucleotide and Nucleoside?

30. Answer the following:

a) Arrange the Hydrogen halides (HF, HCl, HBr and HI) in the decreasing order of their reducing character.

b) NH_3 has higher boiling point than PH_3. Why?

c) Give the composition of Interhalogen compounds.

SECTION D

Question number 31- 33 are long answer type carrying 5 marks each.

31. Account for the following:

a) Sulphurous acid is a reducing agent.

b) Flourine forms only one oxoacid.

c) Boiling point of noble gases increases from He to Rn.

d) Halogens have maximum negative electron gain enthalpy.

e) Bi(V) compounds acts as good oxidizing agent.

OR

a) Complete the following chemical reactions:

i) $CaF_2 + H_2SO_4 \rightarrow ?$

ii) $XeF_6 + KF \rightarrow ?$

iii) $I^- + H^+ + O_2 \rightarrow ?$

b) Noble gases have low boiling points. Why?

c) O and Cl have nearly same electronegativity, yet oxygen forms H bond while Cl does not. Why?

32. Account for the following:

a) Formaldehyde gives Cannizaro's reaction whereas acetaldehyde does not.

b) Carboxylic acid do not give characteristic reactions of carbonyl group.

c) Nitrobenzoic acid is stronger than benzoic acid.

d) P^H should be 3.5 during addition of ammonia derivatives to aldehydes and ketones.

e) Benzophenone does not react with $NaHSO_3$.

OR

a) How will you prepare aldehyde from i) Alcohol ii) Acid chloride?

b) Give reactions of ethanal with i) Sodium bisulphite ii) Hydroxyl amine

iii) Lithium aluminium hydride.

33. a) Define Limiting molar conductivity.

b) How does conductivity vary with concentration?

c) Calculate e.m.f of the cell (E_{cell}) for the following galvanic cell at 298K:

Cr/Cr^{3+} (0.01M) // Fe^{2+}(0.1M)/Fe

[Given: E^0 (Cr^{3+}/Cr) = - 0.74V and E^0 (Fe^{2+}/Fe) = - 0.44V]

OR

a) Define the term Cell constant.

b) How does molar conductivity vary with concentration (dilution)?

c) Calculate the standard free energy change and equilibrium constant (K_c) for the cell:

$2Cr + 3 Cd^{2+} \longrightarrow 2Cr^{3+} + 3Cd$ [Given: E^0_{Cell} = +0.34V, 1F= 96,500C/mol]

Kochi Metro Sahodaya
Model Question Paper, 2020-21
CHEMISTRY

Grade: **Time: 3hrs**

Roll No: **Marks: 70**

General Instructions:

Read the following instructions carefully.

a) There are 33 questions in this question paper. All questions are compulsory.
b) Section A: Q. No. 1 to 16 are objective type questions. Q. No. 1 and 2 are passage based questions carrying 4 marks each while Q. No. 3 to 16 carry 1 mark each.
c) Section B: Q. No. 17 to 25 are short answer questions and carry 2 marks each.
d) Section C: Q. No. 26 to 30 are short answer questions and carry 3 marks each.
e) Section D: Q. No. 31 to 33 are long answer questions carrying 5 marks each.
f) There is no overall choice. However, internal choices have been provided.
g) Use of calculators and log tables is not permitted.

SECTION -A (objective type)

1. Read the passage given below and answer the following questions: **(1x 4=4)**

Ethanol is used as solvent, fuel, starting material for many synthesis. Its reaction with iodine and NaOH produces yellow powder which is an antiseptic. Phenol is used to prepare various pain killers by its reaction with CO_2 and NaOH followed by other reactions. Ether is generally prepared by Williamson's synthesis.

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) Name the reaction which occurs with phenol and CO_2+ NaOH

a) Kolbe's reaction
b) Williamson's synthesis
c) Reimer-Tiemann reaction
d) Friedal – crafts reaction

(ii) Name the compound added to ethanol for making denaturated alcohol.

a) propanol
b) Methanol
c) butanol
d) none of these

(iii) Name the yellow product formed on reaction of ethanol, with I_2 and NaOH.

a) trichloromethane
b) triiodomethane
c) dichloromethane
d) tetrachloromethane

OR

The IUPAC name of $CH_3OC_2H_5$ is

a) methoxy ethane
b) propoxy methane
c) ethyl methyl ether
d) diethyl ether

(iv) Chemical name of aspirin (pain killer)

a) phenyl salicylate
b) picric acid
c) methyl salicylate
d) 2- Acetoxy benzoic acid

Read the passage given below and answer the following questions: (1x4=4)

Adsorption is a surface phenomenon where more concentration of adsorbate is on surface of adsorbent. In general easily liquefying gas adsorbed more readily and adsorption increases with increase in pressure and decreases with increase in temperature. Freundlich adsorption isotherm shows the extent of adsorption with pressure. In colloidal system there are two phases namely dispersed phase and dispersion medium. The dispersed phase possess charge and surrounded by dispersion medium particles through opposite dipole, this attraction stabilised the sol. On neutralisation of this charge by electrolyte lead to coagulation. The coagulation power of an electrolyte depends on Hardy-Schulze rule.

2.In these questions (Q. No 5-8), a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c) Assertion is correct statement but reason is wrong statement.
d) Assertion is wrong statement but reason is correct statement.

(i) Assertion: Coagulation power of Al^{3+} is more than that of Na^+
Reason: Greater the valency of the flocculating ion added, greater is its power to cause precipitation.

(ii) Assertion: In physisorption, adsorption decreases with increase in temperature.
Reason: Physisorption is of exothermic nature.

(iii) Assertion: Fe^{3+} ions can be used for the coagulation of As_2S_3 sol.
Reason: Fe^{3+} ions react with As_2S_3 to give Fe_2S_3

(iv) Assertion: Colloidal solutions are electrically neutral

Reason: Dispersed phase and dispersion medium carry same charge.

Following questions (No. 3 -11) are multiple choice questions carrying 1 mark each:

3. The standard reduction potentials of three metallic cations X, Y and Z are +0.52, -3.03V and -1.18V respectively. The order of reducing power is

a) Y> Z>X b) X>Y>Z C) Z>Y>X d) Z>X>Y

4.The sugar which is not a disaccharide in the following is

a) Lactose b) Galactose c) Sucrose d) Maltose

OR

Which one of the following statements is correct?

a) All amino acids are optically active
b) All amino acids except glycine are optically active
c) All amino acids except glutamine acid are optically active
d) All amino acids except lysine are optically active.

5. An unripe mango placed in a concentrated salt solution to prepare pickles , shrivels because

a) it gains water due to osmosis
b) it loses water due to reverse osmosis
c) it gains water due to reverse osmosis
d) it loses water due to osmosis

6. Which of the following is most stable in aqueous solution?

a) Mn^{2+} b) Cr^{3+} c) V^{3+} d) Ti^{3+}

OR

Which does not belong to first transition series?

a) Fe b) V c) Ag d) Cu

7. Towards electrophilic substitution , the most reactive is

a) nitrobenzene
b) aniline hydrochloride
c) aniline
d) N- acetylaniline

OR

Reaction of nitrous acid with aliphatic primary amine in cold gives

a) a diazonium salt b) an alcohol c) a nitrite d) a dye

8. The correct IUPAC name of [$Pt(NH_3)_2Cl_2$] is

a) diamminedichloridoplatinum(II)
b) diamminedichloridoplatinum(0)
c) diamminedichloridoplatinum(IV)
d) dichloridodiammineplatinum(IV)

OR

Which one of the following ligands forms a chelate?

a) acetate b) oxalate c) cyanide d) ammonia

9. Which one of the following characteristics of the transition metals is associated with higher catalytic activity?

a) high enthalpy atomisation
b) paramagnetic behaviour
c) colour of hydrate ions
d) variable oxidation states.

10. Which of the following is an example of vic-dihalide?

a) dichloromethane
b) 1,2-dichloroethane
c) ethylidene chloride
d) allylchloride

11. Percentage of free space in body centred cubic unit cell is

a) 34% b) 28 % c) 30 % d) 32 %

In the following questions (Q. No. 12 - 16) a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c) Assertion is correct statement but reason is wrong statement.
d) Assertion and reason both are incorrect statement.

12. Assertion: Aryl halides show SN^2 reaction.
Reason: Trend of SN^2 reaction for alkyl halides is $3^0<2^0<1^0$.

13. Assertion: Cellulose is polymer of β-glucose attached with β-glycosidic linkage.
Reason: It gives lot of energy to animals on digestion.

14. Assertion: SF_6 cannot be hydrolysised but SF_4can be.
Reason: Six F atoms in SF_6 prevent the attack of H_2O on sulphur atom of SF_6.

15. Assertion: Aquatic species are made comfortable in warm water than in cold water.
Reason: K_H value for both N_2 and O_2 decreases with increase in temperature.

OR

Assertion: The boiling point of 0.1 M urea is less than 0.1M KCl solution.

Reason: Elevation of boiling point is directly proportional to the number of species present in the solution.

16. Assertion: Aromatic aldehydes and formaldehyde undergo Cannizarro reaction.

Reason: Aromatic aldehydes are almost as reactive as formaldehyde.

SECTION B

The following questions, Q.No 17 – 25 are short answer type and carry 2 marks each.

17. Write the definitions of the following:

i) Enantiomers ii) Chiral compounds

OR

What are ambident nucleophiles? Give an example.

18. The cutting of onions at low temperature is more comfortable than cutting of onions at room temperature. Why is it so?

19. When a co-ordination compound $CrCl_3.6H_2O$ is mixed with $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write

i) structural formula of the complex.

ii) IUPAC name of the complex.

OR

Define crystal field splitting energy. Why are low spin tetrahedral complexes rarely observed?

20. A reaction is of second order with respect to a reactant. How is the rate of reaction affected if the concentration of the reactant is reduced to half? What is the unit of rate constant for such a reaction?

OR

Explain the terms

i) Rate determining step of a reaction

ii) Molecularity of a reaction

21. Find out two- third (2/3) life of a first order reaction in which K= 5.48 x 10^{-14} S^{-1}(log3=0.4771)

22. Distinguish between

i) Ethanol and phenol

ii) propan-2-ol and 2-methyl propan-2-ol

23. Answer the following

i) Why does fluorine not play the role of a central atom in interhalogen compounds?

ii) Why do noble gases have very low boiling points?

24. How do you convert

i) chlorobenzene to biphenyl

ii) 2- bromobutane to but-2-ene.

25.An element has atomic mass 93 g mol^{-1} and density 11.5 gcm^{-3}. If the edge length of its unit cell is 300 pm, identify the type of unit cell.

SECTION C

Q.No 26 -30 are Short Answer Type II carrying 3 mark each.

26. The elements of 3d transition series are given as:

Sc Ti V Cr Mn Fe CO Ni Cu Zn

Answer the following

i) Which element has the highest melting point and why?

ii) Which element is a strong oxidizing agent in + 3 oxidation state and why?

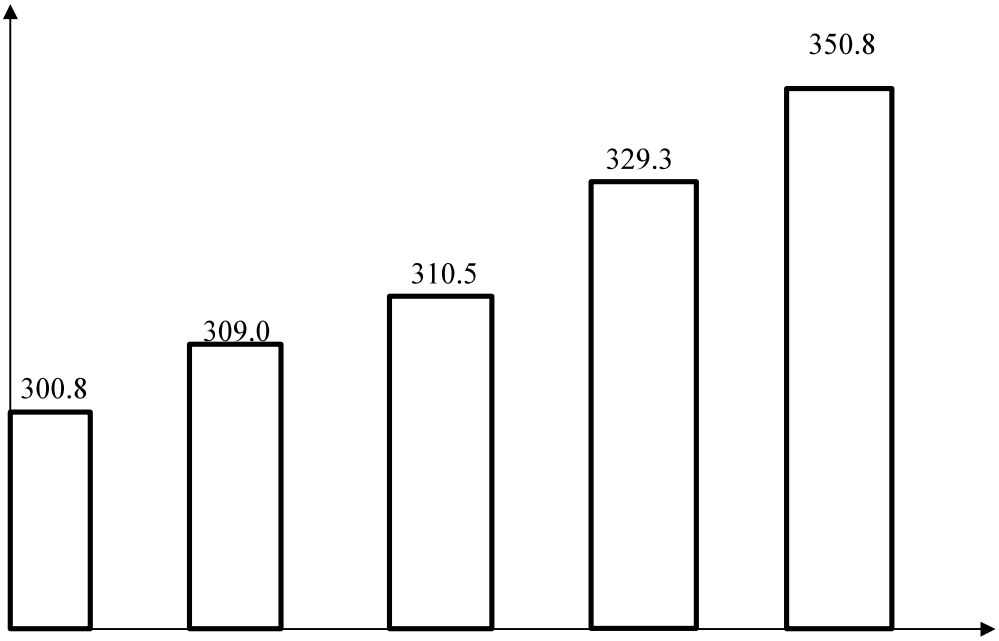
iii) Which element is soft and why?

OR

i) Name the element which shows only +3 oxidation state.

ii) What is lanthanoid contraction? Name an important alloy which contains some of the lanthanoid metals.

27.Observe the histogram showing boiling points of pentane, isopentane, 1^0,2^0 and 3^0 amines.



i) Why does ethanol have higher boiling point than ethanamine?

ii) Why are primary amines more soluble in water than 2^0 and 3^0 amines?

iii)Arrange the compounds show in graph, increasing order of boiling point.

OR

Complete the following reaction

i) $CH_3CH_2NH_2 + CHCl_3 + \text{alc.KOH} \rightarrow$

ii) $C_6H_5N_2^+Cl^- \xrightarrow[\text{(room temp)}]{H_2O}$

iii) $C_6H_5NH_2 + HCl\ (aq) \rightarrow$

28. i) Why does LiCl acquire pink colour when heated in Li vapour?

ii) A solid with cubic crystal is made of two elements ‘p’ and ‘Q’. Atoms of ‘Q’ are at the corners of the cube and ‘P’ at body centre. What is the formula of compound?

29. i) Which one of the following is a monosaccharide?
Starch, maltose, fructose, cellulose.

ii) What is the difference between acidic amino acids and basic amino acids?

iii)What type of linkage is present in proteins?

30. Draw the structures of the following compounds

i) XeF_4 ii) $HClO_4$ iii) BrF_3

SECTION D

Q.No 31 to 33 are long answer type carrying 5 marks each.

31. i) Account for the following

a) Reducing character decreases from SO_2 to TeO_2.

b) $HClO_3$ is a stronger acid than HClO.

c) Xenon forms compounds with fluorine.

ii) Complete the equation

a)$XeO_2F_2 + H_2O \rightarrow$

b) $6\ XeF_4 + 12H_2O \rightarrow$

OR

i) Compare the oxidizing power of F_2 and Cl_2 by considering parameters such as bond dissociation enthalpy, electron gain enthalpy and hydration enthalpy.

ii) Arrange the following in increasing directions as per instruction

a) H_2S, H_2Se, H_2O (reducing power)

b) SO_3, SeO_3, TeO_3 (acidic nature)

32. i) Explain the following name reactions with suitable chemical reaction(s):

a) Clemmensen's reduction b) HVZ reaction

ii) Carry out the following conversions (in not more than two steps)

a) Ethanol to propan-2-ol
b) Phenol to salicylic acid
c) Methanal to 3- hydroxy propanal

OR

i) Give reasons

a) CH_3CHO is more reactive than CH_3COCH_3 towards HCN
b) 4- nitrobenzoic acid is more acidic than benzoic acid.

ii) Describe the following

a) Cannizzaro reaction
b) Cross aldol condensation
c) Rosenmund reaction

33. i) The conductivity of 0.001 mol L^{-1} solution of CH_3COOH is 3.905 x 10^{-5} S cm^{-1}. Calculate its molar conductivity and degree of dissociation(α).

Given: $\lambda^0 (H^+)$ = 349.6 Scm^2 mol^{-1} and $\lambda^0 (CH_3COO^-)$ = 40.9 Scm^2 mol^{-1}.

ii) Define limiting molar conductivity. Why conductivity of an electrolyte solution decreases with the decrease in concentration?

OR

i) State Kohlrausch's law of independent migration of ions. Mention one application of Kohlrausch's law.

ii) The standard electrode potential (E^0) for Daniel cell is +1.1V. Calculate the ΔG^0 for the reaction

$Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$ (1F= 96500$Cmol^{-1}$)

iii) Write any two factors on which conductivity depends on.

Kochi Metro Sahodaya
Model Question Paper
Computer Science (083)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A has 2 sections:
   a. Section – I is short answer questions, to be answered in one word or one line.
   b. Section – II has two case studies questions. Each case study has 4 case-based sub-parts. An examinee is to attempt any 4 out of the 5 subparts.
4. Part - B is Descriptive Paper.
5. Part- B has three sections
   a. Section-I is short answer questions of 2 marks each in which two question have internal options.

   b. Section-II is long answer questions of 3 marks each in which one question have internal options.

   c. Section-III is very long answer questions of 5 marks each .

   All programming questions are to be answered using Python Language only

Question No.	Part-A	Marks allocated
	Section-I	
	Select the most appropriate option out of the options given for each question. Attempt any 15 questions from question no 1 to 21.	
1	The default separator character of print() is _____	**1**
2	Which of the following can be considered as valid identifiers? a)Hello-world2 b) _helloworld2 c) 2_hello world d) hello_world@1	**1**
3	[1,2] not in [1,2,3] returns _____	**1**
4	Write a statement in Python to declare a dictionary D with 100 keys, 0,1…99, each having values as 200.	**1**

5	A _____ function is used to write contents of file buffer onto storage file.	**1**
6	Function range(10,5,-2) will yield an iterable sequence like _____ [10,8,6] b) [6,8,10] c) [9,7,5] d) [5,7,9]	**1**
7	What is wrong with the following statement? n=input("number:") sqr=n*n	**1**
8	_____statement abandons the current iteration of the loop.	**1**
9	What is the output of the following string operation? st="Computer Sciencs 12" print(st.isalnum())	**1**
10	A tuple is declared as T = (23,8.6,'hello',41,'x'). What will be the value of T[:1:-1]?	**1**
11	_____ protocol tells each system how to form mail messages and transfer them between computers.	**1**
12	Name the network device that takes a weak and corrupted signal and regenerates it.	**1**
13	Name the switching technique used for voice communication.	**1**
14	Which of the following is the fastest media of data transfer? Co-axial Cable b) Twisted pair Cable c) Fibre Optic d) None of these	**1**
15	Consider the following statement. What type of statement is this? DROP TABLE school; a)DDL b)DML c) DCL d)TCL	**1**
16	SSL is the abbreviation of _____.	**1**
17	In SQL, name the aggregate function that returns the number of records in a table.	**1**
18	What is the meaning of "GROUP BY" clause in Mysql?	**1**

19	Relation R1 has 10 tuples and 7 attributes. Relation R2 has 4 tuples and 5 attributes. When a NATURAL JOIN is achieved between R1 and R2, how many attributes would the resultant set have?	**1**
20	In SQL, name the clause that is used to display the tuples in descending order of an attribute.	**1**
21	Name the library required for database programming in Python.	**1**
	Section-II	
	Both the Case study based questions are compulsory. Attempt any 4 sub parts from each question. Each question carries 1 mark	
22	Consider the following table GRADUATE. Write SQL commands for the following statements (c) to (e) TABLE : GRADUATE	

ROLLNO	NAME	STIPEND	SUBJECT	AVERAGE	DIV
101	KARAN	400	PHYSICS	68	I
102	DIWAKAR	450	COMP Sc	68	I
103	DIVYA	300	CHEMISTRY	62	I
104	REKHA	350	PHYSICS	63	I
105	ARJUN	500	MATHS	38	IV
106	SABINA	400	CEHMISTRY	55	II
107	JOHN	250	PHYSICS	64	I
108	ROBERT	450	MATHS	68	I
109	RUBINA	500	COMP Sc	62	I
110	VIKAS	400	MATHS	57	II

	a) Identify the attribute best suitable to be declared as a primary key	**1**
	b) Write the degree and cardinality of the table GRADUATE	**1**
	c) Display the detail of all students who secured an average below 40	**1**
	d) Display the name of those students whose name starts with 'D'.	**1**
	e) To increase the stipend of physics students by 100	**1**

23	Complete the following instructions to delete the details of a customer from a csv file 'cust.csv' which contain slno, customer name,city and amount.
	import _____
	record = list()
	custname= input("Please enter a customer name to delete:")
	with open('cust.csv', 'r') _____:
	  data = csv.reader(f)
	  for row in data:
	  record.append(row)
	  for field in row:
	  if field == custname:
	  record._____
	with open('cust.csv', 'w') as f:
	  writer = _____
	  writer._____(record)
		1
		1
		1
		1
		1

	Part – B	
	Section-I	
24	Evaluate the following expressions: a) 5 < (5>3 and 10<20) b) 3**2-81//9%2 + (3+4)	**2**
25	What is the difference between LAN and Internet ? **OR** Briefly mention two advantages and two disadvantages of Star topology in network.	**2**
26	Expand the following terms: a) FDMA ii) POP iii) GSM iv) GPRS	**2**
27	Differentiate between a local variable and global variable. Give proper examples.	**2**

28	Rewrite the following code in python after removing all error(s). Underline each correction done in the code.
	
	STRING=""HAPPY NEW YEAR"
	for S in range[0,14]:
	  print STRING(S)
	  STRING=STRING.lower
		2

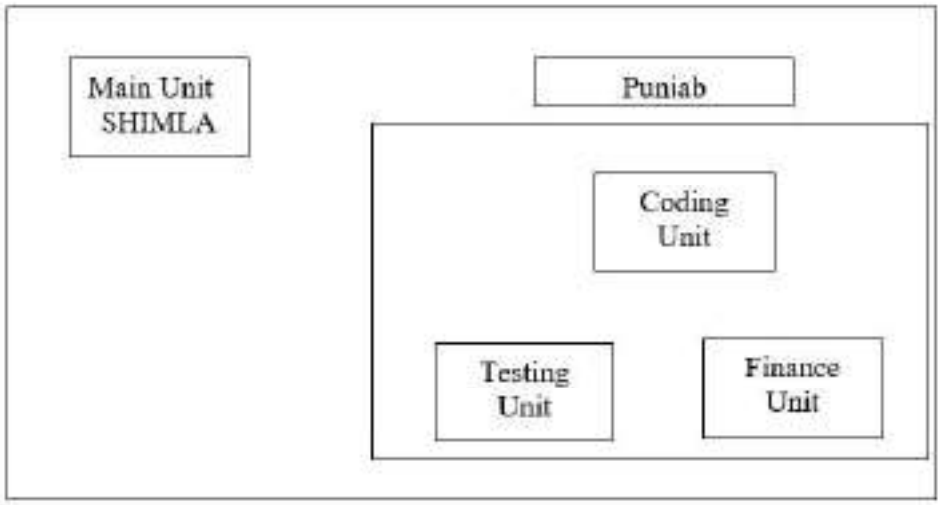
29	What are the possible outcome(s) executed from the following code? Also specify the maximum and minimum values that can be assigned to variable COUNT.
	Assume that the required modules are imported.
	
	txt="CBSEONLINE"
	COUNT =random.randint(0,3)
	c=9
	while txt[c]!='L':
	  print(txt[c]+txt[COUNT],end='*')
	  COUNT = COUNT +1
	  c =c-1
	
	i) EC*NB*IS* ii) NS*IE*LO*
	iii) EB*NS*IO* iv) ES*NE*IO*
		2

30	Differentiate between Data Definition Language and Data Manipulation Language	**2**
31	Differentiate between Candidate Key and Alternate Key in context of RDBMS with suitable example. **OR** Differentiate between Degree and Cardinality with suitable example.	**2**
32	Differentiate between fetchall() and fetchmany() methods with suitable examples for each.	**2**

33	Find and write the output of the following Python code:
	
	def Mycode(Msg,ch):
	  s=""
	  for cnt in range(len(Msg)):
	  if Msg[cnt]>='P' and Msg[cnt]<='S':
	  s=s+Msg[cnt].lower()
	  else:
	  if Msg[cnt]=='N' or Msg[cnt]=='n' or Msg[cnt]==' ':
	  s=s+ch
	  else:
	  if(cnt%2==0):
	  s=s+Msg[cnt].upper()
	  else:
	  s=s+Msg[cnt-1]
	  print(s)
	Mycode("Input Raw","@")
		2

	Section- II	
34	Write a user defined function in python SHIFT(lst) that would accept a list as argument .The function should shift the negative numbers of the list to right and the positive numbers to left without using a another list. For example if list initially contains [3, -5, 1, 3, 7, 0, -15, 3, -7, -8] Then after shifting list should contain [3, 1, 3, 7, 0, 3, -8, -7, -15, -5]	**3**
35	Aditi has used a text editing software to type some text. After saving the article as WORDS.TXT, she realised that she has wrongly typed alphabet J in place of alphabet I everywhere in the article. Write a function definition for JTOI() in python that would display the corrected version of entire content of the file WORDS.TXT with all the alphabets "J" to be displayed as an alphabet "I" on screen. **Example**: If Aditi has stored the following content in the file WORDS.TXT: WELL, THJS JS A WORD BY JTSELF. YOU COULD STRETCH THJS TOBE A SENTENCE The function JTOI() should display the following content: WELL, THIS IS A WORD BY ITSELF. YOU COULD STRETCH THIS TOBE A SENTENCE	**3**
36	Write the outputs of the SQL queries (i) to (iii) based on the relations Products and Suppliers given below: Table: **PRODUCTS** **PID** | **PNAME** | **QTY** | **PRICE** | **COMPANY** | **SUPCODE** 101 | DIGITAL CAMERA 14X | 120 | 12000 | RENIX | S01 102 | DIGITAL PAD 11i | 100 | 22000 | DIGI POP | S02 104 | PEN DRIVE 16 GB | 500 | 1100 | STOREKING | S01 106 | LED SCREEN 32 | 70 | 28000 | DISPEXPERTS | S02 105 | CAR GPS SYSTEM | 60 | 12000 | MOVEON | S03 Table: **SUPPLIERS** **SUPCODE** | **SNAME** | **CITY** S01 | GET ALL INC | KOLKATA S03 | EASY MARKET CORP | DELHI S02 | DIGI BUSY GROUP | CHENNAI	**3**

	i. SELECT SUPCODE, SUM(PRICE) FROM PRODUCTS GROUP BY SUPCODE;
	ii. SELECT PRICE * QTY AS AMOUNT FROM PRODUCTS WHERE PID=104;
	iii. SELECT PNAME,SNAME FROM PRODUCTS NATURAL JOIN SIPPLIERS WHERE QTY>100;	

37	A linear stack called Books contains the following information: -Book Number ,name of the book and cost of the book Write **PUSH** (Books, N) method in python to add N book details each containing the above mentioned information's. Display the stack if it has at least one element, otherwise display appropriate error message. **OR** A linear stack called Books contains the following information of N Books: -Book Number ,name of the book and cost of the book Write a function in python DISPLAY(Books, N) to display all book details having price less than 500.	**3**
	Section-III	
38	"AYS Software Inc." is planning to expand their network in India, starting with two cities in India to provide Software services. The company has planned to set up their main office units in Punjab at three locations and have named their offices as "Coding Unit", "Testing Unit" and "Finance Unit". The company has its corporate unit in Shimla. A rough layout of the same is as follows:  	**5**

Approximate distances between these Units are as follows:

From	To	Distance
Coding Unit	Testing Unit	16 KM
Coding Unit	Finance Unit	50 Mtr
Finance Unit	Testing Unit	10KM

In continuation of the above, the company experts have planned to install the following number of computers in each of their office units:

Coding Unit	100
Testing Unit	70
Finance Unit	10

i.Suggest the most suitable unit to install the server of the company with a suitable reason.

ii.Suggest the kind of network required (out of LAN,MAN,WAN) for connecting each of the following office units:

- Coding Unit and Testing Unit
- Coding Unit and Finance Unit

iii. Which one of the following devices will you suggest for connecting all the computers within each of their office units?

- Switch/Hub
- Modem
- Bluetooth

iv. Which of the following communication media, will you suggest to be procured by the company for connecting their local offices in Punjab for very effective (High Speed) communication?

- Coaxial cable
- Optical fiber
- Wi Fi network

v. Suggest a cable/wiring layout for connecting the company's local office units located in Punjab and Main Unit.

39	Write SQL commands for the following queries (i) to (v) based on the relations Stationary and Consumer given below: Table: **Stationery** **S_ID** | **StationeryName** | **Company** | **Price** DP01 | Dot Pen | ABC | 10 PL02 | Pencil | XYZ | 6 ER05 | Eraser | XYZ | 7 PL01 | Pencil | CAM | 5 GP02 | Gel Pen | ABC | 15 Table: **Consumer** **C_ID** | **ConsumerName** | **Address** | **S_ID** 01 | Good Learner | Delhi | PL01 06 | Write Well | Mumbai | GP02 12 | Topper | Delhi | DP01 15 | Write & Draw | Delhi | PL02 16 | Motivation | Bangalore | PL01 i. To display the details of those consumers whose Address is Delhi. ii. To display the details of Stationery whose Price is in the range of 8 to 15. (Both Value included) iii. To display the ConsumerName, Address from Table Consumer, and Company and Price from table Stationery, with their corresponding matching S_ID. iv. To increase the Price of all Stationery by 2. v. To display average price amount of each comapny.	**5**
40	A binary file "GIFTS.DAT" has structure {" Gift_ID ":value, " Name ":value, " Remarks ":value, " Price ":value} i. Write a function BUMPER() in Python to read each record of a binary file GIFTS.DAT, find and display details of those gifts, which has remarks as "ON DISCOUNT". ii. Write a function TRANSFER( ) in python, that would copy all those records which are having price greater than 500 to "G_COPY.DAT".	**5**

Kochi Metro Sahodaya
Model Question Paper

CLASS XII - ECONOMICS (030)

MM – 80 **TIME: 3 HOURS**

General Instructions:

- This question paper contains two parts:
  Part A - Macro Economics (40 marks)
  Part B - Indian Economic Development (40 marks)
- Marks for questions are indicated against each question.
- Question No. 1-10 and Question No. 18 – 27 are 1 mark questions and are to be answered in one word/sentence.
- Case Based Questions (CBQ's) are Question No. 7-10 and Question No. 25-27.
- Question No. 11-12 and Question No. 28 – 29 are 3 marks questions and are to be answered in 60 - 80 words each.
- Question No. 13-15 and Question No. 30 – 32 are 4 marks questions and are to be answered in 80-100 words each.
- Question No. 16-17 and Question No. 33 – 34 are 6 marks questions and are to be answered in 100-150 words each.
- Answers should be brief and to the point and the above word limit be adhered to as far as possible.

Q.no	Questions	Marks
	Part A - Macro Economics	
1.	Bread and butter are _____ goods where as tractors and harvesters are _____ goods. a) Final consumer, final consumer b) Final producer, final producer c) Final producer, final consumer d) Final consumer, final producer OR If Real GDP in 2019 is 500 and Nominal GDP in 2019 is 650, find GDP deflator. a) 110 b) 130 c) 120 d) 100	1 1
2.	In the present situation of covid, many banks would have faced financial emergency. If you own a bank and there is financial emergency in your bank, then _____ is the only institution that can come to the rescue of your bank. (Central Bank/ Commercial bank)	1
3.	Money that is issued by the authority of the government is called_____ a) Full bodied money	1

b) Credit money
c) Fiat money
d) Fiduciary money

4. Identify the correct pair of statements from the following column I and column II. 1

	Column I		Column II
A	Open market operations	(i)	Qualitative measure
B	Margin requirement	(ii)	Minimum ratio of total bank deposits which they have to keep with themselves
C	Banker's bank	(iii)	Function of Central bank
D	Reserve requirement	(iv)	Sale and Purchase of Securities

a) A-(i)
b) B-(ii)
c) C-(iii)
d) D-(iv)

5. Identify which of the following statements is true? 1
a) Mint value of a currency implied paper value of that currency.
b) Exchange rate is the price of a currency expressed in terms of gold.
c) Managed floating is also known as dirty floating.
d) Revaluation leads to arise in supply of foreign currency.

6. Borrowing of rest of the world would be recorded as_____ item in the_____ account. 1

a) Credit, capital
b) Debit, capital
c) Credit, current
d) Debit, current

Read the following news report and answer Questions 7-10 on the basis of the same:

'COVID-19 to have significant deflationary impact due to demand evaporation'

Ruling out any impact of stimulus on the price situation, Chief Economic Advisor K. V. Subramanian on Thursday said the COVID-19 pandemic has severely dented the demand for non-essential or discretionary goods, creating deflationary conditions. He also said that a good part of the `20 lakh crore stimulus package is designed in a manner that the fiscal deficit remains under control.

"COVID has a significant deflationary impact because demand especially for non-essential or discretionary goods and services will go down

	significantly. Therefore, it is unlikely that there would be too much inflationary impact through fiscal deficit or stimulus package," Subramanian told in an interview. The proposed stimulus package will generate demand by infusing liquidity into the system and thus perk up the economy, the CEA said. (The Economic Times; May 15th, 2020)	
7.	Deficiency of demand creates _____ (deflationary gap/ inflationary gap)in the economy.	1
8.	Demand for _____ goods has gone significantly down during covid period. a) Non-essential b) Essential c) Both (a) and (b) d) None of these	1
9.	The proposed stimulus package has tried to create_____ (more / less) demand in the economy.	1
10.	Inflationary gap: a) Raises the level of output. b) Does not change the level of output. c) Raises the general price level. d) Both (b) and (c)	1
11.	State with valid reason, which of the following statement is true or false: a) GDP growth as an index of welfare loses its importance if there is deep economic divide in the economy. b) Real GDP may increase without any increase in the quantity of output in the economy.	3
12.	State, giving valid reasons, whether the following statements are true or false: a) Appreciation of the Indian currency occurs when more rupees are to be paid for US dollar. b) Flexible exchange rate is determined by IMF. OR 'Devaluation and depreciation are one and the same thing'. Defend or refute the statement, with valid argument.	3 3
13.	Legal tender money is also known as fiat money'. Comment.	4
14.	In an economy 75 percent of the increase in income is spent on consumption. Investment is increased by Rs.1,000 crore. Calculate: a) Total increase in income. b) Total increase in consumption expenditure.	4

<table>
<tr><td></td><td>OR
Explain the meaning of Marginal Propensity to Consume. What is its relationship with Marginal Propensity to Save?</td><td>4</td></tr>
<tr><td>15.</td><td>“CRR cut will improve bottom line, says Karnataka Bank CEO”.
Private lender Karnataka Bank MD and CEO Mahabaleshwara M S on Friday said the Reserve Bank of India (RBI) slashing the Cash Reserve Ratio (CRR) by 100 basis points (BPS) from 4 % to 3 % will improve the bottom line of banks. “The three months repayment moratorium on all loans without down gradation of assets will mitigate debt servicing burden and go a long way in overcoming the financial stress caused by Covid-19”, he said in a statement.
(The Economic Times, 27th March,2020)

Describe how the above mentioned monetary instrument in news report is helpful in correcting the situation of excess demand and deficient demand.</td><td>4</td></tr>
<tr><td>16.</td><td>a) ‘GDP as an index of welfare of a country has some limitations’. Defend or refute the given statement with valid reason.
b) ‘Payment of fees to a lawyer engaged by a firm’. State with valid reason, should the given payment be included or not included in the estimation of national income of India.
OR
Calculate the Net National Product at Market Price from the given details:
<table>
<tr><td>S.No.</td><td>Particular</td><td>(in Crores)</td></tr>
<tr><td>(i)</td><td>Mixed income of self-employed</td><td>8,000</td></tr>
<tr><td>(ii)</td><td>Depreciation</td><td>200</td></tr>
<tr><td>(iii)</td><td>Profit</td><td>1,000</td></tr>
<tr><td>(iv)</td><td>Rent</td><td>600</td></tr>
<tr><td>(v)</td><td>Interest</td><td>700</td></tr>
<tr><td>(vi)</td><td>Compensation of employees</td><td>3,000</td></tr>
<tr><td>(vii)</td><td>Net indirect taxes</td><td>500</td></tr>
<tr><td>(viii)</td><td>Net factor income to abroad</td><td>60</td></tr>
<tr><td>(ix)</td><td>Net exports</td><td>(–)50</td></tr>
<tr><td>(x)</td><td>Net current transfers to abroad</td><td>20</td></tr>
</table></td><td>3

3

6</td></tr>
<tr><td>17.</td><td>Classify the following items as revenue and capital expenditure and give reason for your answer:-
a) Subsidies
b) Grants by the government
c) Construction of school building</td><td>

2
2
2</td></tr>
<tr><td></td><td><u>Part – B: Indian Economic Development</u></td><td></td></tr>
<tr><td>18.</td><td>Railways were introduced in India in _____
a) 1853
b) 1850</td><td>1</td></tr>
</table>

	c) 1851 d) 1854	
19.	_____ is an economy in which means of production are used in a manner such that social welfare is maximised. a) Capitalist economy b) Socialist economy c) Mixed economy d) Free economy	1
20.	Read the following statements Assertion (A) and Reason (R). Choose one of the correct alternatives given below: Assertion (A): Five year plans gave a big push to the basic and capital goods industries. Reason(R): Indian economy is now ranked as the eleventh largest industrial economy in the world. Alternatives: a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion(A). b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). c) Assertion (A) is true but Reason (R) is false. d) Assertion (A) is false but Reason (R) is true. OR Read the following statements Assertion (A) and Reason (R). Choose one of the correct alternatives given below: Assertion (A): Economic and social equality was considered as the principal goal of planning. Reason(R): Real income of the people decreased due to high rate of inflation. Alternatives: a) Both Assertion (A) and Reason (R) are true and Reason(R) is the correct explanation of Assertion (A). b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). c) Assertion (A) is true but Reason (R) is false. d) Assertion (A) is false but Reason (R) is true.	1 1
21.	Read the following statements-Assertion (A) and Reason (R). Choose one of the correct alternatives given below: Assertion(A):Wage goods are luxuries of life. Reason(R):Agriculture provides wage goods to about 121 crore of people in India.	1

	Alternatives: a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion(A). b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). c) Assertion(A) is true but Reason (R) is false. d) Assertion (A) is false but Reason (R) is true.	
22.	Choose the correct pair of statement from the following column I and column II: Column I: A – One child policy; B – Jobless growth process; C – Problem of environmental degradation; D – Commune system of farming Column II: (i) India; (ii) China; (iii) Pakistan; (iv) Collective farming a) A-(i) b) B-(ii) c) C-(iii) d) D-(iv)	1
23.	China surpassed India and Pakistan in_____ sector of the economy. a) Primary b) Manufacturing c) Tertiary d) None of these	1
	Read the following hypothetical case study carefully and answer the question numbers 24-27 on the basis of the same. Diversification includes two aspects-one relates to change in cropping pattern and the other relates to a shift of workforce from agriculture to other allied activities like livestock, poultry, fisheries etc. and non-agriculture sector. The need for diversification arises from the fact that there is greater risk in depending exclusively on farming for livelihood. Diversification towards new areas is necessary not only to reduce the risk from agriculture sector but also to provide productive sustainable livelihood options to rural people. Much of the agricultural employment activities are concentrated in the Kharif season. But during the Rabi season, in areas where there are inadequate irrigation facilities, it becomes difficult to find gainful employment. Therefore, expansion into other sectors is essential to provide supplementary gainful employment and in realising higher levels of income for rural people to overcome poverty and other tribulations. Hence, there is a need to focus on allied activities, non-farm employment and other emerging alternatives of livelihood, though there are many other options available for providing sustainable livelihoods in rural areas.	

<table>
<tr><td>24.</td><td>_____ relates to a shift of work force from agriculture to other allied activities. (Monocropping / Diversification)</td><td>1</td></tr>
<tr><td>25.</td><td>Livestock comes under the category of_____activities. (Allied / Diversification)</td><td>1</td></tr>
<tr><td>26.</td><td>Diversification provides_____ options to rural people. (Livelihood / Irrigation)</td><td>1</td></tr>
<tr><td>27.</td><td>It is difficult to find gainful employment in_____ season, in areas where there are inadequate irrigation facilities. (Kharif / Rabi)</td><td>1</td></tr>
<tr><td>28.</td><td>‘Economic growth occurs when GDP rises’. Defend the statement with valid reasons.
OR
Distinguish between formal workers and informal workers.</td><td>3

3</td></tr>
<tr><td>29.</td><td>Discuss briefly about Regional Rural Banks.</td><td>3</td></tr>
<tr><td>30.</td><td>“British intended to achieve some objectives through their policies of infrastructure”. Explain the given statement.</td><td>4</td></tr>
<tr><td>31.</td><td>‘Protection of small scale industry and regulation of large scale industry was prevalent before1991’. Justify the rationale of the given statement.
OR
Explain the term globalisation. Explain ‘long term trade policy’ of the globalisation of the Indian economy.</td><td>4

4</td></tr>
<tr><td>32.</td><td>Compare and analyse the given data of India, Pakistan and China with valid arguments.

<table>
<tr><td colspan="7">Structure of Growth - India, Pakistan and China</td></tr>
<tr><td rowspan="2">Sector</td><td colspan="3">% Share in GDP</td><td colspan="3">% Share in Employment</td></tr>
<tr><td>India</td><td>Pakistan</td><td>China</td><td>India</td><td>Pakistan</td><td>China</td></tr>
<tr><td>Primary</td><td>15.4</td><td>24.4</td><td>7.9</td><td>47</td><td>42.3</td><td>27.7</td></tr>
<tr><td>Secondary</td><td>23.1</td><td>19.1</td><td>40.5</td><td>22</td><td>22.6</td><td>28.8</td></tr>
<tr><td>Tertiary</td><td>61.5</td><td>56.5</td><td>51.6</td><td>31</td><td>35.1</td><td>43.5</td></tr>
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</td><td>4</td></tr>
<tr><td>33.</td><td>a) ‘‘Challenge of poverty must be given prior importance than environmental degradation’’. Discuss the rationale of the given statement with valid reasons.
b)‘‘Sustainable development is a process to be taken as a daily life activity’’. Establish the rationale of the given statement with valid reasons.
OR
a) Why are female workers in rural areas unwilling to migrate outside jobs?</td><td>3

3

2

4</td></tr>
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	b)Analyse the change in occupational structure of the country on the basis of the following table: **Sector** / **% of Workforce**: 1950 - 51 / 2017 - 18 Primary: 72.72 / 43.8 Secondary: 10.02 / 24.7 Tertiary: 17.26 / 31.5 Total: 100 / 100	
34.	State giving the valid reasons whether the following statements are true or false. a) Higher percentage of work force in rural areas suggests a higher contribution of the rural economy to GDP. b) Workforce is the difference between total population and number of persons not working. c) Lack of ware housing causes loss of revenue to the farmers.	2 2 2

Kochi Metro Sahodaya
Model Question Paper
ENGLISH (CODE 301) GRADE XII

1. This paper is divided into two parts A and B. All questions are compulsory
2. Separate instructions are given with each section and question, wherever necessary. Read these instructions very carefully and follow them.
3. Do not exceed the prescribed word limit while answering the questions.

PART A
READING

1. Read the passage carefully:

1. No student of a foreign language needs to be told that grammar is complex. By changing word sequences and by adding a range of auxiliary verbs and suffixes, we are able to communicate tiny variations in meaning. We can turn a statement into a question, state whether an action has taken place or is soon to take place, and perform many other word tricks to convey subtle differences in meaning. Nor is this complexity inherent to the English language. All languages, even those of so-called 'primitive' tribes have clever grammatical components. The Cherokee pronoun system, for example, can distinguish between 'you and I', 'several other people and I' and 'you, another person and I'. In English, all these meanings are summed up in the one, crude pronoun 'We'. Grammar is universal and plays a part in every language, no matter how widespread it is. So, the question which has baffled many linguists is— who created grammar?
2. At first, it would appear that this question is impossible to answer. To find out how grammar is created, someone needs to be present at the time of a language's creation, documenting its emergence. Many historical linguists are able to trace modern complex languages back to earlier languages, but in order to answer the question of how complex languages are actually formed, the researcher needs to observe how languages started from scratch. Amazingly, however, this is possible.
3. Some of the most recent languages evolved due to the Atlantic slave trade. At that time, slaves from a number of different ethnicities were forced to work together under colonizer's rule. Since, they had no opportunity to learn each other's languages, they developed a make-shift language called a pidgin. Pidgins are strings of words copied from the language of the landowner. They have little in the way of grammar, and in many cases it is difficult for a listener to deduce when an event happened, and who did what to whom. Speakers need to use circumlocution in order to make their meaning understood. Interestingly, however, all it takes for a pidgin to become a complex language is for a group of children to be exposed to it at the time when they learn their mother tongue. Slave children did not simply copy the strings of words uttered by their elders, they adapted their words to create a new, expressive language. Complex grammar systems which emerge from pidgins are termed creoles and they are invented by children.
4. Further evidence of this can be seen in studying sign languages for the deaf. Sign languages are not simply a series of gestures; they utilise the same grammatical machinery that is found in spoken languages. Moreover, there are many different languages used worldwide. The creation of one such language was documented quite recently in Nicaragua. Previously, all deaf people were isolated from each other, but in 1979 a new government introduced schools for the deaf. Although children were taught speech and lip reading in the classroom, in the playgrounds they began to invent their own sign system, using the gestures that they used at home. It was basically a pidgin. Each child used the signs differently, and there was no consistent grammar. However, children who joined the school later, when this inventive sign system was already around, developed a quite different sign language. Although it was based on the signs of the older children, the younger children's language was more fluid and compact, and it utilised a large range of grammatical devices to clarify meaning. What is more, all the children used the signs in the same way? A new creole was born.

5. Some linguists believe that many of the world's most established languages were creoles at first. The English past tense –ed ending may have evolved from the verb 'do'. 'It ended' may once have been 'It end-did'. Therefore, it would appear that even the most widespread languages were partly created by children. Children appear to have innate grammatical machinery in their brains, which springs to life when they are first trying to make sense of the world around them. Their minds can serve to create logical, complex structures, even when there is no grammar present for them to copy.

1.1. On the basis of your understanding of the passage, answer any ten of the following questions by choosing the most appropriate option: (1x10=10)

(a) Complexity in language is inherent to.....
(i) all the languages (ii) English
(iii) tribal languages (iv) primitive languages

(b) The Cherokee pronoun system can distinguish between.....
(i) you and I (ii) several other people and I
(iii) you, another person and I (iv) all of these

(c) Based on your understanding of the passage, choose the option that lists the correct sequence of the sentences associated with the formation/ creation of grammar.
1. In order to answer the question of how complex languages are actually formed, the researcher needs to observe how languages started from scratch.
2. Slaves developed a make-shift language called a pidgin.
3. Some linguists believe that many of the world's most established languages were creoles at first.
4. To find out how grammar is created, someone needs to be present at the time of a language's creation.

(i) 1, 2, 3, 4 (ii) 3, 4, 1, 2
(iii) 4, 1, 2, 3 (iv) 2, 1, 3, 4

(d) All the following sentences about Nicaraguan sign language are true except:
(i) the language has been created since 1979
(ii) the language is based on speech and lip reading
(iii) the language incorporates signs which children used at home
(iv) the language was perfected by younger children

(e) Which option represents who partly invented the complex grammar system even for the most widespread languages?


(1) (2) (3) (4)

(i) image 1 (ii) image 2
(iii) image 3 (iv) image 4

(f) Some of the most recent languages evolved due to the.....
(i) atlantic slave trade (ii) complex grammar system
(iii) weak pronunciation (iv) none of these

(g) What is common to all languages?
(i) basic grammar (ii) the sign rules
(iii) grammar is common to all languages (iv) series of gestures

(h) According to the passage what can be attributed as a consequence of the Atlantic slave trade?
(i) language's creation and documenting its emergence
(ii) evolution of some of the most recent languages
(iii) many word tricks can be performed to convey subtle differences in meaning
(iv) a statement can be turned into a question

(i) What are creoles?
(i) sign languages of deaf
(ii) complex grammar systems which emerge from pidgins

(iii) strings of words copied from the language of the landowner
(iv) logical grammar invented by children

(j) Which word in the passage means opposite to 'easy'? (para 1)

(i) sequences (ii) variation
(iii) crude (iv) complex

(k) Pick the option that correctly tells how the younger children's mind work in the absence of grammatical knowledge.

1. They create logical structures. 2. They imitate others.
3. They have innate grammatical machinery in their brains.
4. They learn other languages.

(i) 2 and 3 (ii) 1 and 3
(iii) 2 and 4 (iv) 3 and 4

2. Read the passage carefully:

1. When plastic waste is burnt, a complex weave of toxic chemicals is released. Breaking down Poly Vinyl Chloride (PVC) used for packaging, toys and coating electrical wires. It produces dioxin, an organochlorine which belongs to the family of Persistent Organic Pollutants (POPs). A recent Dioxin Assessment Report brought out by the United States Environment Protection Agency (USEPA) says the risk of getting cancer from dioxin is ten times higher than reported by the agency in 1994.

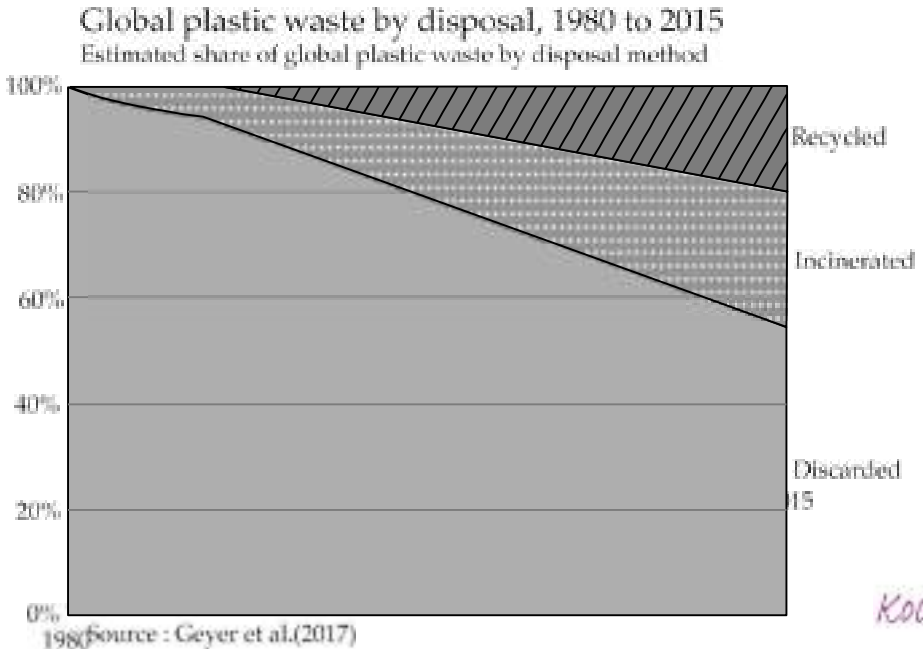
2. Yet the Delhi government is giving the green signal to a gasification project which will convert garbage into energy without removing plastic waste. Former transport minister Rajendra Gupta, the promoter of this project, says this is notnecessary.

He claims no air pollution will be caused and that the ash produced can be used as manure. An earlier waste-to-energy project set-up in Timarpur failed. The new one, built with Australian assistance, will cost ` 200 crore. It will generate 25 megawatts of power and gobble 1,000 tonnes of garbage everyday.

3. "Technologies like gasification are a form of incineration," says Madhumita Dutta, central coordinator with Toxics Link, New Delhi. Incineration merely transfers hazardous waste from a solid form to air, water and ash, she points out. Toxins produced during incineration include acidic gases, heavy metals as well as dioxins and furans. "The 'manure' will be hazardous and a problem to dispose," says Dutta.

4. Municipal solid waste contains a mix of plastics. Breaking down this waste emits hydrochloric acid which attacks the respiratory system, skin and eyes, resulting in coughing, vomiting and nausea. Polyethylene generates volatile compounds like formaldehyde and acetaldehyde, both suspected carcinogenic. Breathing styrene from polystyrene can cause leukaemia. Polyurethane is associated with asthma. Dioxin released by PVC is a powerful hormone disrupter and causes birth defects and reproductive problems. There is no threshold dose to prevent it and our bodies have no defence against it.

5. "Even the best run incinerators in the world have to deal with stringent norms, apart from contaminated filters and ash, making them hugely expensive to operate," says Dutta. In Germany, air pollution



devices accounted for two-thirds the cost of incineration. Despite such efforts, the European Dioxin Inventory noted that the input of dioxin into the atmosphere was the highest from incineration.

6. How has global plastic waste disposal method changed over time? In the chart, we see the share of global plastic waste that is discarded, recycled or incinerated from 1980 through to 2015. Prior to 1980, recycling and incineration of plastic was negligible; 100 percent was therefore discarded. From 1980 for incineration and 1990 for recycling, rates increased on average by about 0.7 percent per year.In 2015, an estimated 55 percent of global plastic waste was discarded, 25 percent was incinerated and 20 percent recycled.

7. "India does not have the facility to test dioxin and the cost of setting one up is prohibitively expensive," says Dutta.Besides, Indian garbage has a low calorific content of about 800 cal/kg, since it has high moisture and requires additional fuel to burn. Toxics link calculates that the electricity generated from such technology will cost between ` 5-7 per unit, which is six times higher than conventional energy. India has chosen a dioxin preventive route and burning of chlorinated plastics is prohibited under Municipal Solid Waste and Biomedical Rules.

Nearly 80 percent of Indian garbage is recyclable or compostable. Resident associations, the informal sector and the municipal corporation can make Delhi's garbage disappear in a sustainable manner. "Instead, the government promotes end of pipeline solutions," says Dutta.

2.1. On the basis of your understanding of the passage, answer any ten of the following questions by choosing the most appropriate option: (1x10=10)

(a) Dioxine causes ……..

(i) cancer (ii) heart attack

(iii) hypertension (iv) sickness

(b) Which statements are NOT TRUE according to the passage?

1. India has adopted a preventive measure under which burning of chlorinated plastics is prohibited.
2. USEPA says that the risk of getting cancer from dioxin is hundred times higher than reported by the agency in 1994.
3. Incineration merely transfers hazardous waste from a solid form to air, water and ash.
4. Hydrochloric acid attacks the digestive system, nose and eyes which results in diabetes and nausea.

(i) 2 and 4 (ii) 1 and 3

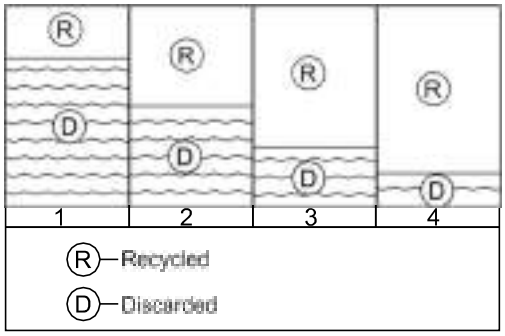
(iii) 3 and 4 (iv) 1 and 2

(c) Garbage can be converted into energy by ……..

(i) gasification (ii) gratification

(iii) a chemical process (iv) incinators

(d) Based on the graphical chart in the passage, chose the option that correctly states the ratio between discarded waste to recycled global plastic waste in 2015.



(i) option 1 (ii) option 2

(iii) option 3 (iv) option 4

(e) Before 1980, how much global plastic waste was discarded?

(i) 40% (ii) 60%

(iii) 80% (iv) 100%

(f) Based on the given graphical representation of data in the passage, choose the option that lists the statements that are TRUE.

1. In the year 2015, the incinerated plastic waste disposal was 80%.
2. In the year 1980, share of discarded plastic waste was 100%.
3. Discarded plastic waste was 60% in the year 2010.
4. Recycled plastic waste in the year 2000 was less than 70%.

(i) 1 and 3 (ii) 2 and 3
(iii) 1 and 4 (iv) 3 and 4

(g) Former transport minister Rajendra Gupta claims that during gasification, ash produced can be used as .....
(i) fuel (ii) manure
(iii) pesticide (iv) none of these

(h) Converting waste to energy project will consume how much energy?
(i) 20 megawatts (ii) 200 megawatts
(iii) 250 megawatts (iv) 25 megawatts

(i) By 2015, how much global plastic waste has been incinerated?
(i) 55% (ii) 25%
(iii) 20% (iv) 0.7%

(j) Which word in the passage means same as 'waste material'? (para 2)
(i) gasification (ii) garbage
(iii) pollution (iv) manure

(k) Arrange the sentences in the order in which they occurred year wise.
1. From 1980, rates increased on average by about 0.7 percent per year for incineration.
2. 20 percent waste was recycled in 2015.
3. Prior to 1980, recycling and incineration of plastic was negligible.
4. In 2015, an estimated 55 percent of global plastic waste was discarded.

(i) 2, 1, 4, 3 (ii) 4, 2, 3, 1
(iii) 1, 3, 4, 2 (iv) 3, 1, 4, 2

LITERATURE

3. Read the extract given below and answer any two of the questions that follow: (1x8=8)

3.1. "Why not organise yourself into a cooperative?" I asked a group of young men who have fallen into the vicious circle of middlemen who trapped their fathers and forefathers.

(a) Who is asking to organise into a cooperative?
(i) Gandhiji (ii) Rajkumar Shukla
(iii) Rajendra Prasad (iv) none of these

(b) Why does the writer say that the young men have fallen into the vicious circle of middlemen?
(i) because they are not able to form cooperative societies for their betterment.
(ii) because they are exploited by them
(iii) because they fall prey to middlemen
(iv) all of these

(c) Which of the following words cannot replace the word, 'vicious'?
(i) ruthless (ii) remorseless
(iii) malevolent (iv) benevolent

(d) Since when the so called 'young men' had been exploited?
(i) since their childhood (ii) when they grow up
(iii) since the time of their father (iv) since the time of their ancestors

3.2. Then, from one thing to another, M. Hamel went on to talk of the French language, saying that it was the most beautiful language in the world — the clearest, the most logical; that we must guard it among us and never forget it, because when a people are enslaved, as long as they hold fast to their language it is as if they had the key to their prison. Then he opened a grammar and read us our lesson.

(a) Which is M.Hamel's language?
(i) French (ii) German
(iii) English (iv) Spanish

(b) Identify the literary device in 'from one thing to another'.
(i) metaphor (ii) personification
(iii) allusion (iv) hyperbole

(c) What is Hamel asking the people to do for their language?
(i) forget their language (ii) begin learning German
(iii) guard their language (iv) learn their language

(d) How could the enslaved people have the key to the prison?

(i) if they ask the prisoner for it (ii) if they do not leave their language

(iii) if they snatch the key (iv) if they do not leave their country

3.3. Now Sadao remembered the wound and with his expert fingers he began to search for it. Blood flowed freshly at his touch. On the right side of his lower back Sadao saw that a gun wound had been reopened. The flesh was blackened with powder. Sometime, not many days ago, the man had been shot and had not been tended. It was bad chance that the rock had struck the wound.

(a) Who was wounded?

(i) Sadao (ii) Hana

(iii) soldier (iv) Yumi

(b) Which word best suits 'trained' in the extract?

(i) touch (ii) tended

(iii) expat (iv) expert

(c) What kind of wound the man had?

(i) it was a knife stab (ii) it was an injury

(iii) it was a gun shot (iv) it was due to spikes on rocks

(d) How old was the wound?

(i) few days old (ii) a month old

(iii) a week old (iv) many days old

3. Read the extract given below and answer any one of the questions that follow: (1x4=4)

3.1 It would be an exotic moment
without rush, without engines, we
would all be together
in a sudden strangeness.

(a) What will happen if there will be no rush or running of engines?

(i) it will be boring (ii) people will suffer a lot

(iii) it will be a moment of tranquility (iv) all the animals will come on the road

(b) Why the moment is called 'exotic'?

(i) there will be pollution free environment (ii) as we all will be enveloped in quietness

(iii) flora and fauna will grow (iv) there will be heavenly flow of wind

(c) What is the poetic device used in the phrase 'we would'?

(i) imagery (ii) alliteration

(iii) antithesis (iv) repetition

(d) Which strangeness is the poet talking about?

(i) feeling of loneliness

(ii) feeling of oneness with their fellow human beings

(iii) feeling of depression

(iv) terrible feeling of strangeness

3.2 On their slag heap, these children
Wear skins peeped through by bones and spectacles of steel with mended glass, like bottle bits on stones.
All of their time and space are foggy slum.
So blot their maps with slums as big as doom.

(a) Which two images are used to describe the slums?

(i) foggy slum & wear skins (ii) spectacles of steel & Foggy slums

(iii) foggy slums & slums as big as doom (iv) slag heap & slums as big as doom

(b) What sort of life do these children lead?

(i) carefree (ii) happy

(iii) deprived (iv) dependent

(c) What is the figure of speech used in 'So blot their maps with slums as big as doom'.

(i) analogy (ii) simile

(iii) personification (iv) hyperbole

(d) **What** type of spectacles do these children wear?

(i) the glasses of the spectacles are broken (ii) they wear steel rimmed spectacles

(iii) they wear discarded spectacles by the rich (iv) all of these

4. Answer any eight of the following questions: (1x8=8)

(a) Why did M. Hamel blame himself?

(i) for not having taught them enough French (ii) for not being strict

(iii) for not being responsible (iv) for giving students a holiday at times

(b) Why did Saheb not go to school?

(i) he had no money to pay fees

(i) he wanted to be a businessman

(ii) he wanted to earn money

(iii) he had problems comprehending his school work

(c) What was the peddler's cherished pastime?

(i) to think highly of the world.

(ii) to think of plans to rob people

(iii) to think of people whom he knew caught in the dangerous snare

(iv) to think richly of himself

(d) What was written in the letter that Gandhiji received from the magistrate?

(i) a warrant for arrest by the court

(ii) to give up the fight

(iii) not to hold demonstrations

(iv) Lieutenant-General had decided to drop the case against him.

(e) Why did Douglas go to Lake Wentworth in New Hampshire?

(i) for a campfire picnic

(ii) to keep away from friends

(iii) to test whether he had overcome the fear of water

(iv) to practice for a swimming competition

(f) How did Hana correlate General Takima's attitude towards his wife and the prisoner?

(i) he was cunning (ii) he was cruel

(iii) he was self-centred (iv) all of these

(g) What did Jo want to listen from her father the next day after Skunk was given his original smell back?

(i) Jo wanted her father to change the ending of the story.

(ii) she wanted the wizard to hit mommy Skunk on her head

(iii) she wanted the wizard to leave Roger with the smell of roses.

(iv) all of these

(h) Why did Mr. Lamb help Derry?

(i) he wanted to see Derry happy and confident

(ii) he wanted him to feel sorry for himself.

(iii) he wanted Derry to fear the world

(iv) he wanted Derry to lose confidence in himself.

(i) Describe the town of Galesburg, Illinois?

(i) Galesburg had huge buildings with small gardens

(ii) Galesburg had big old frame houses, and huge lawns

(iii) Galesburg had busy streets

(iv) Galesburg had shopping malls

(j) What did the Governor tell the Secretary of the Examination Board about Evans?

(i) Evans was one of the stars at the Christmas concert

(ii) Evans could imitate well-known persons

(iii) Evans was a congenital kleptomaniac

(iv) all of these

PART B

WRITING

1. Draft a notice in not more than 50 words for your school notice board informing the students of the Prefectorial Board about the upcoming meeting. You are Manjit/Manjita, Coordinator of Pragyan Public School. **(3 MARKS)**

OR

Keeping in view the situation of COVID-19, your tuition teacher has decided to start Online coaching classes. Write an advertisement in not more than 50 words on behalf of her.

2. Recently your showroom 'Swag Fashions' opened a fashion outlet. You announced the opening and inauguration of 'Swag Exclusive Outlet' to be held at 12, M.G. Road, Chennai. Write a formal invitation for the same in not more than 50 words. **(3 MARKS)**

OR

Write a formal reply on behalf of Mr. Ashutosh regretting his inability to attend the Silver Jubilee wedding anniversary of Mrs and Mr. Vohra in about 50 words.

3. You are Sujatha/Sujoy, resident of 112- B, Anmol Nagar, Ujjain. You are pained to see the increasing cases of female foeticide. Write a letter to the editor of News-24, giving some suggestions to make the people aware of this in 120-150 words. **(5 MARKS)**

OR

You are Nitin/Nitima living in Mysore. You have just completed Hotel Management Course and looking for a job. While browsing through The Times of India, you came across an advertisement for the requirement of an executive chef in Hotel Marriott . Write an application in about 120-150 words for the same giving your resume.

Hotel Marriott

Vacancy for the post of Executive Chef

Hotel Marriott, Bangalore, is looking for an executive chef for immediate placement. She/he should have in-depth knowledge of F&B Kitchen Management and controls, good communication skills, and specialize in culinary art.

Apply within seven working days of publication of this advertisement to the HR Manager – Hotel Marriott, Bangalore.

4. The importance of a newspaper cannot be overlooked in this fast moving era. The people lay down their grievances for the consideration of the government through the newspaper. Write an article on the 'Functions of a newspaper' in 120-150 words. You are Ankit/Ankita.' You may use the cues given below along with your own ideas. **(5 MARKS)**

- Importance of the newspaper
- Main mode of communication
- Keeps people updated with global and local news
- Mode of contemporary history
- Government and people
- Grievances of people

OR

You are Vijay/Vijaya, Assembly Secretary of Army Police Public School, Vasant Kunj. Write a report in 120- 150 words on the felicitation ceremony held in your school. You may use the cues given below along with your own ideas.

- Felicitation ceremony for academic and co-curricular achievers
- Chief Guest of the programme
- Introductory dance
- Address by principal and chief guest
- Cash tokens to the toppers and all round topper

LITERATURE

3. **Attempt Any Five out of the six questions given below, in 30-40 words each.** **(2 × 5 = 10)**

(i) What does Neruda mean by 'an exotic moment without rush' in his poem. 'Keeping Quiet'?

(ii) Explain the metaphor of the rattrap in context of the story by Selma Lagerlöf .

(iii) Kamala Das speaks of 'an old familiar ache. ..' What do you think is the reason for this feeling?

(iv) Comment on the significance of the villagers sitting at the back in M. Hamel's classroom.

(v) 'Little has moved with time, it seems, in Firozabad.' State any one reason why the writer says this.

(vi) How does the poet use the poet use the image of 'fingers fluttering through the wool' to highlight Aunt Jennifier's victimisation?

4. **Attempt Any Two out of the three questions given below in 30-40 words each.** **(2 × 2 = 4)**

(i) In his letter to Charley, Sam writes,' ....then I got to believing you were right.' What could have made
Sam begin to believe?

(ii) It was important that the recaptured Evans keep up the façade till the very last moment of his interaction with the Governor. Support this statement with a rationale.

(iii) Sadao's acceptance of the General's plan to assassinate Tom was counterproductive to having put him on the path of recovery. Substantiate with reason/s.

5. **Attempt Any One of the following questions in 120-150 words** **(1 × 5 = 5)**

(A) The story *Deep Water* talks about Douglas' attempts to overcome his fear of water. The story can also be viewed as a figurative manifestation of life's many challenges. Elaborate with reference to the text.

OR

(B) How does the story, 'Rattrap' highlight the importance of community over isolation? Support your rationale with textual evidence.

6. Attempt Any One out of the following questions in 120-150 words **(1 × 5 = 5)**

(A) Mr. Lamb calls Derry his friend while Derry refuses his affirmation. Would you consider their relationship with each other as friendship? Support your answer with reference to the instance(s) from the text.

OR

(B) How does the story, 'Should Wizard Hit Mommy', who would you support, Wizard or Mommy? Justify your choice.

KOCHI METRO SAHODAYA
AISSCE MODEL EXAMINATION (2020-2021)
ENGLISH

CLASS: XII

MARKS: 80
TIME: 3hrs.

GENERAL INSTRUCTIONS:

Question paper is divided into 2 sections.
Section A READING 40 Marks
Section B WRITING 40 Marks
All sections are compulsory.
You may attempt any question at a time.
All the questions of that particular section must be attempted in the correct order.

READING

1. Read the passage carefully: **(10 Marks)**

1. The youth is a dynamo, an ocean, an inexhaustible reservoir of energy. But this energy cannot be kept caged in prison. Its basic nature is to flow, to express itself. The youth energy on the basis of the nature of its expression can be divided into four categories.

2. The vast majority of the youth today is with the establishment, whose formula of life is learn, earn, burn and enjoy. It means learn to operate the modern devices and employ them to earn the maximum amount of wealth to the point of burning the natural resources of the earth, as well as yourself out, and then enjoy your own funeral. This category of youth is intelligent, skilful and hardworking but it lacks insight and foresight. They are self-indulgent and any sense of moral code of conduct is alien to their nature. Neither are they able to see in depth, to find out whether there is a deeper meaning and purpose to their human life, nor have they the capacity to look beyond the tips of their nose to find out the consequences of their way and approach, where it is leading them to. They are the ends into themselves and enjoyment is the motto of their life.

3. The second category of youth in nature and approach is the same but as it is less privileged and less qualified and skilled; it has lesser opportunities for earning and enjoying. Such youth may be incited to be against the establishment. This opposition takes various forms. When it is well-organized and systemic it may take the form of political opposition and even go to the extent of expressing itself in unjust ways. When the opposition is not so intense and organized, it remains contended with giving verbal expression to its resentment periodically. The youth of the above two categories need to be shown the right path to positively channelize their energy.

4.The third section of youth is a sober and thoughtful class of people, which objectively observes and studies the phenomenon of development of the world. These youth find that man in his insatiable thirst for consumption has become blind and lost the sense of distinction between milk and blood. Today man in his mad rush for exploitation is sucking the blood of Mother Earth; leading to their destruction and is thereby digging his own grave. This responsible category of young people is looking for an alternative mode of

development based on co-operation between man and man. This development based on mutual love, friendship and harmony is not only sustainable but leading to endless prosperity mutually. To bring about his natural revolution from death-movement to life-movement is the aim of this group.

5. The fourth and most vital group of youth which is going to steer humanity into the third millennium and act as the pioneer for the future development of planetary life is engaged in evolving a new way of life and releasing a new principle of global consciousness through a fundamental research in the science of life. The science of life is a new branch of knowledge which takes the whole man into account without dividing him into subjective and objective halves of spirituality and physicality and does not treat him either as a refined (thinking) animal or an ethereal entity, having its base in some other non-physical world. It rather, recognizes man as a basic unit of conscious life which has got immense, practically inexhaustible, possibilities and potentialities for evolution, development and growth. As per the Vedic formula, man is the micro-cosmos and his fullest flowering and enfoldment lies in his identification with the cosmos.

1.1 On the basis of your understanding of the passage, answer any ten of the following questions by choosing the most appropriate option: (10 Marks)

(a) Which trait is lacking in the youth that is dexterous with the modern devices?
(i) intelligence (ii) perseverance
(iii) foresight (iv) skillfulness

(b) Which category of youth supports the view that man's growth lies in his identification with cosmos?
(i) the youth that will take us to the third millennium
(ii) that which supports sustainable development
(iii) youth that opposes the establishment
(iv) youth that is self-indulgent and unscrupulous

(c) Which of the following options accurately describes the third category of youth?
1. Intelligent and skillful 2. Thoughtful and observant
3. Less intelligent and skillful 4. Problem solver and caring

(i) 1 and 3 (ii) 2 and 4
(iii) 3 and 4 (iv) 1 and 4

(d) The thoughtful class of people wants cooperation between
(i) man and man (ii) man and nature
(iii) man and animals (iv) man and environment

(e) Which two categories of youth need to be shown the right path to help them channelize their energy?
(i) first and third (ii) second and fourth
(iii) first and second (iv) third and fourth

(f) As per the Vedic formula, man's fullest flowering and enfoldment lies in the.....

(i) Opposition of the cosmos (ii) cosmos
(iii) Identification of the cosmos (iv) none of these

(g) Which option represents the CORRECT traits of fourth group of youth?

(i) option 1 (ii) option 2
(iii) option 3 (iv) option 4

(h) How does the dissatisfied youth express itself?

(i) engage in political opposition (ii) engage in theft
(iii) engage in wrong doings (iv) engage in immoral acts

(i) In how many categories can youth energy be divided?

(i) three (ii) four
(iii) two (iv) one

(j)Which word in the passage means same as 'important'? (para 5)

(i) pioneer (ii) entity
(iii) vital (iv) ethereal

(k) Which of the following options accurately describes the second category of youth?

(i) less privileged and less skillful
(ii) intelligent and skillful
(iii) thoughtful and observant
(iv) may resort to unjust ways and can be incited against the establishment

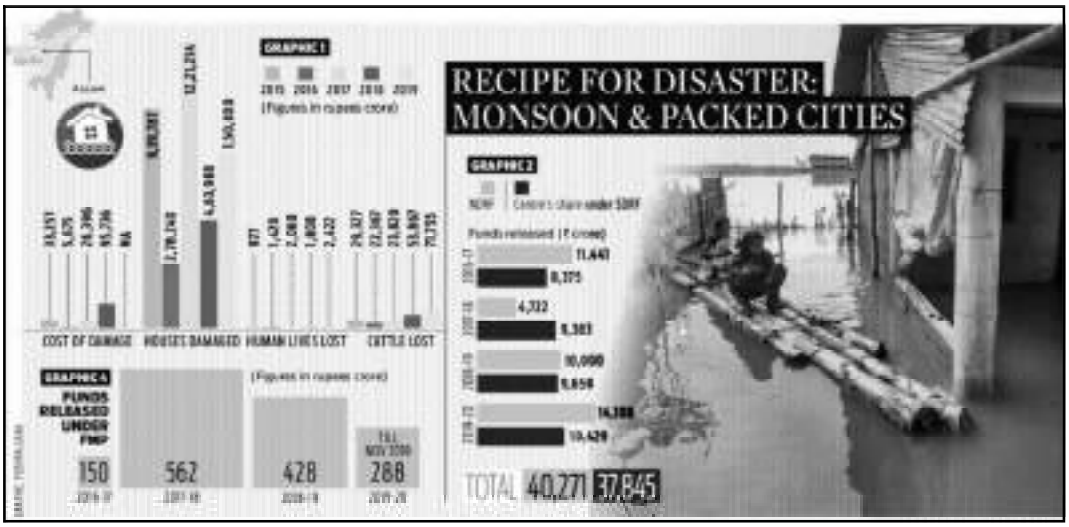
(i) 1 and 3 (ii) 2 and 4
(iii) 3 and 4 (iv) 1 and 4

2. Read the passage carefully: (10 Marks)

1. Over 100 persons have died in the floods in Assam so far while another 147 were killed in lightning strikes in Bihar last month. But with the monsoon season less than half way through, more loss of lives and property are expected if the trend in the past five years is anything to go by.
2. Take for instance human lives lost. In 2015, a little less than 1,000 persons died of flood and rain-related incidents, but in 2019, nearly 2,500 persons had lost their lives, according to government data. The loss of cattle also increased. While in 2015, less than

30,000 cattle died, in 2019, it was nearly 72,000.(See graphic 1)

3. To sum up the flood and its impact in the past five years, over 8,700 people were killed, over 2 lakh cattle died and more than 36 lakh houses were destroyed in floods. The cost of damage to property has also shot up in these five years. While in 2015, the damage suffered totaled ` 33,257 crore, in 2018, the last year for which data is available, it went up to ` 95,736 crore. The cost of damage is likely to be more in 2019 as over a dozen states, including Bihar, Assam, Himachal Pradesh, Kerala and Maharashtra, witnessed large-scale devastation.



4. Besides the rising damages, the cost to the exchequer towards relief work has also increased. In 2016- 17, the Centre released ` 11,441 cr under the National Disaster Relief Fund while its share under the State Disaster Relief Fund was ` 8,375 crore. This increased to ` 14,108 cr and ` 10,429 cr respectively in 2019-20. (See graphic 2)

5. The flood's increasing loss of lives and property appears to make a mockery of all the expert committees, task forces and commissions the government has formed. In 1972, the Ganga Flood Control Commission was set-up in Patna to address the flood problem and erosion in the Ganga basin states. In 1980, the Brahmaputra Board came into existence to address the flood erosion problem in the northeastern states and Sikkim. (See table)

6. The government also launched a Flood Management Programme in the Eleventh Plan (2007-12) for providing financial assistance to state governments to undertake work related to river management, flood control, anti-erosion, drainage development, flood proofing, among others. The FMP was continued for three years under the Twelfth Plan from 2017-18 to 2019-20. It has subsequently been included as a component of the Flood Management and Border Areas Programme in the Ministry of Jal Shakti. But all these appear to have come to a naught as the government's approach is more reactive than proactive, according to experts. Instead of focusing on the real problem, it was only concerned about relief measures, they said.

7. They pointed out that the area affected by floods has doubled since 1950. "The flood-affected area in 1950 was 25 million hectare, now it has doubled to nearly 50 million

hectare. But, what is surprising is that nobody looks concerned about the real issues. Earlier, only villages used to be affected but now cities are also getting flooded. Chennai and Patna are just examples. I had written to the government in 2015, highlighting the poor drainage system in cities," said former IIT professor Dinesh Kumar Mishra. Himanshu Thakkar, the coordinator of the South Asia Network of Dams, Rivers and People, said effective management of dams could bring down the damage caused by floods. "We have over 5,000 dams. Every dam can help moderate floods in the downstream area but only if it is operated properly," Thakkar said.

Committees & commissions	Aim	Work
Ganga Flood Control Commission	Flood, erosion in Ganga basin states.	Prepared 23 comprehensive master plans.
Rashtriya Barh Aayog	To evolve coordinated, integrated approach for flood control.	Submitted report in 1980 recommending measures Brahmaputra Board.
Brahmaputra Board	Flood, erosion problems in northeastern states.	Prepared 57 master plans for implementation.
Task Force-2004	Flood management and erosion control.	Submitted report in December 2004, recommending short, long-term measures.
Flood Management Programme	To provide financial assistance for river management, flood control, erosion.	Other than allocating financial aid, it is involved in flood forecasting.

2.1. On the basis of your understanding of the passage, answer any ten of the following questions by choosing the most appropriate option: (10 x 1 = 10)

(a)How many people were killed due to lightning in Bihar?

(i) 142 (ii) 157

(iii) 147 (iv) 137

(b) Pick the option from the list below that is NOT TRUE according to the passage.

(i)The floods only affect villages and not cities

(ii)The Flood Management Program continued for three years under the Twelfth Plan from 2017-18 to 2019-20

(iii)If operated properly, dams can help control floods in the downstream areas.

(iv)The area affected by floods has decreased nearly by half since 1950

(i) 1 and 3 (ii) 2 and 4

(iii) 3 and 4 (iv) 1 and 4

(c) The number of cattle that died due to floods in 2019 was ……

(i) nearly 72,000 (ii) 72,000

(iii) 30,000 (iv) less than 30,000

(d)Arrange the following events in chronological order according to the passage.

(i)Flood Management and Border Areas Programme was added as a component to the Twelfth Plan in the Ministry of Jal Shakti

(ii)A Flood Management Plan was set-up in the Eleventh Plan to provide financial assistance to State Governments

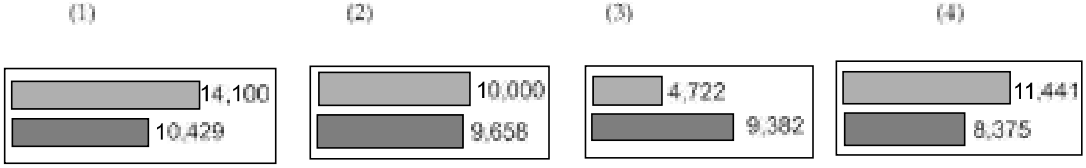
(iii)The Ganga Flood Control Commission was set-up to address flood and erosion problems in the Ganga Basin states.

(iv)The Brahmaputra Board was formed to address flood erosion problems in the north-eastern states and Sikkim

(i) 1, 4, 3, 2 (ii) 2, 1, 4, 3

(iii) 3, 4, 2, 1 (iv) 1, 2, 3, 4

(e) According to the figure, which option best represents the money spent by the National Disaster Relief Fund and the State Disaster Relief Fund in the year 2019-2020?



(i) option 1 (ii) option 2

(iii) option 3 (iv) option 4

(f) How much cost of damage to property has risen in the year 2018

(i) 33,257 crore (ii) 26,396 crore

(iii) 95,736 crore (iv) 5,675 crore

(g) Which states have witnessed a large-scale devastation in the year 2019?

(i) Bihar (ii) Assam

(iii) Himachal Pradesh (iv) all of these

(h) The FMP was continued for three years under the Twelfth Plan for which period?

(i) 2016-17 to 2018-19 (ii) 2015-16 to 2017-18

(iii) 2014-15 to 2016-17 (iv) 2017-18 to 2019-20

(i)Examples of which two cities have been taken which have poor drainage system?

(i) Mumbai and Patna (ii) Chennai and Patna

(iii) Chennai and Mumbai (iv) Assam and Chennai

(j)Which word in the passage means same as 'illustration'? (para 2)

(i) related (ii) according

(iii) instance (iv) nearly

(k)Pick the option from the list below list that is TRUE according to the passage.

(i)The floods only affect villages and not cities
(ii)The Flood Management Program was discontinued after three years under the Twelfth Plan from 2017-18 to 2019-20
(iii)The Task Force – 2004, submitted a report which recommended short and long term measures for flood management and erosion control
(iv)The area affected by floods has doubled from 25 million hectares to 50 million hectares since 1950

(i) 1 and 3 (ii) 2 and 4
(iii) 3 and 4 (iv) 1 and 4

LITERATURE

3. Read the extract given below and answer any two of the questions that follow:
(8 x 1 = 8)

3.1"Why not organize yourself into a cooperative?" I asked a group of young men who have fallen into the vicious circle of middlemen who trapped their fathers and forefathers.

(a)Who is asking to organize into a cooperative?
(i)Gandhiji (ii) Rajkumar Shukla
(iii) Rajendra Prasad (iv) none of these

(b)Why does the writer say that the young men have fallen into the vicious circle of middlemen?
(i) because they are not able to form cooperative societies for their betterment.
(ii) because they are exploited by them
(iii)because they fall prey to middlemen
(iv)all of these.

(c) Which of the following words cannot replace the word, 'vicious'?
(i)ruthless (ii) remorseless
(iii) malevolent (iv) benevolent

(d)Since when the so called 'young men' had been exploited?
(i) since their childhood (ii) when they grow up
(iii) since the time of their father (iv) since the time of their ancestors

3.2 Then, from one thing to another, M. Hamel went on to talk of the French language, saying that it was the most beautiful language in the world — the clearest, the most logical; that we must guard it among us and never forget it, because when a people are enslaved, as long as they hold fast to their language it is as if they had the key to their prison. Then he opened a grammar and read us our lesson.
(a)Which is M.Hamel's language?
(i)French (ii) German
(iii) English (iv) Spanish

(b)Identify the literary device in 'from one thing to another'.

(i)metaphor (ii) personification

(iii) allusion (iv) hyperbole.

©What is Hamel asking the people to do for their language?

(i)forget their language (ii) begin learning German

(iii) guard their language (iv) learn their language

(d)How could the enslaved people have the key to the prison?

(i)if they ask the prisoner for it (ii) if they do not leave their language

(iii) if they snatch the key (iv) if they do not leave their country

3.3 Now Sadao remembered the wound and with his expert fingers he began to search for it. Blood flowed freshly at his touch. On the right side of his lower back Sadao saw that a gun wound had been reopened. The flesh was blackened with powder. Sometime, not many days ago, the man had been shot and had not been tended. It was bad chance that the rock had struck the wound.

(a)Who was wounded?

(i)Sadao (ii) Hana

(iii) soldier (iv) Yumi

(b)Which word best suits 'trained' in the extract?

(i)touch (ii) tended

(iii) expat (iv) expert

©What kind of wound the man had?

(i)it was a knife stab (ii) it was an injury

(iii) it was a gun shot (iv) it was due to spikes on rocks

(d)How old was the wound?

(i)few days old (ii) a month old

(iii) a week old (iv) many days old

4.Read the extract given below and answer any one of the questions that follow:

(4 x 1 = 4)

4.1. It would be an exotic moment
without rush, without engines,
we would all be together
in a sudden strangeness.

(a)What will happen if there will be no rush or running of engines?

(i)it will be boring (ii) people will suffer a lot

(iii) it will be a moment of tranquility (iv) all the animals will come on the road

(b)Why the moment is called 'exotic'?

(i)there will be pollution free environment
(ii) as we all will be enveloped in quietness
(iii)flora and fauna will grow
(iv) there will be heavenly flow of wind

©What is the poetic device used in the phrase 'we would'?
(i) imagery (ii) alliteration
(ii) antithesis (iv) repetition

(d)Which strangeness is the poet talking about?
(i)feeling of loneliness
(ii)feeling of oneness with their fellow human beings
(iii)feeling of depression
(iv)terrible feeling of strangeness

4.2 **……**On their slag heap, these children
Wear skins peeped through by bones and spectacles of steel with mended glass, like bottle bits on stones.
All of their time and space are foggy slum.
So blot their maps with slums as big as doom.

(a)Which two images are used to describe the slums?
(i) foggy slum & wear skins (ii) spectacles of steel & Foggy slums
(iii) foggy slums & slums as big as doom (iv) slag heap & slums as big as doom

(b)What sort of life do these children lead?
(i) carefree (ii) happy
(iii) deprived (iv) dependent

(c) What is the figure of speech used in 'So blot their maps with slums as big as doom'.
(i) analogy (ii) simile
(iii) personification (iv) hyperbole

(d)What type of spectacles do these children wear?
(i)the glasses of the spectacles are broken
(ii) they wear steel rimmed spectacles
(iii)they wear discarded spectacles by the rich
(iv)all of these

5. Answer any eight of the following questions: **(8 x 1 = 8)**

(a)Why did M. Hamel blame himself?
(i)for not having taught them enough French
(ii) for not being strict
(iii)for not being responsible
(iv)for giving students a holiday at times

(b) Why did Saheb not go to school?
(i)he had no money to pay fees
(ii)he wanted to be a businessman
(iii)he wanted to earn money
(iv)he had problems comprehending his school work

©What was the peddler's cherished pastime?
(i)to think highly of the world.
(ii) to think of plans to rob people
(iii)to think of people whom he knew caught in the dangerous snare
(iv)to think richly of himself

(d)What was written in the letter that Gandhiji received from the magistrate?
(i)a warrant for arrest by the court
(ii)to give up the fight
(iii)not to hold demonstrations
(iv)Lieutenant-General had decided to drop the case against him.

(e)Why did Douglas go to Lake Wentworth in New Hampshire?
(i)for a campfire picnic
(ii)to keep away from friends
(iii)to test whether he had overcome the fear of water
(iv)to practice for a swimming competition

(f)How did Hana correlate General Takima's attitude towards his wife and the prisoner?
(i) he was cunning (ii) he was cruel
(iii) he was self-centered (iv) all of these

(g)What did Jo want to listen from her father the next day after Skunk was given his original smell back?
(i) Jo wanted her father to change the ending of the story.
(ii) she wanted the wizard to hit mommy Skunk on her head
(iii)she wanted the wizard to leave Roger with the smell of roses.
(iv)all of these

(h)Why did Mr. Lamb help Derry?
(i)he wanted to see Derry happy and confident
(ii)he wanted him to feel sorry for himself.
(iii)he wanted Derry to fear the world
(iv)he wanted Derry to lose confidence in himself.

(i)Describe the town of Galesburg, Illinois?
(i)Galesburg had huge buildings with small gardens
(ii)Galesburg had big old frame houses, and huge lawns

(iii)Galesburg had busy streets
(iv)Galesburg had shopping malls

(i)What did the Governor tell the Secretary of the Examination Board about Evans?
(i)Evans was one of the stars at the Christmas concert
(ii)Evans could imitate well-known persons
(iii)Evans was a congenital kleptomaniac
(iv)all of these

PART - B
WRITING

1. You have lost your class XII Physics book in the playground while playing football. Draft a notice in not more than 50 words for your school notice board informing the students about it. You are Chetan/Chetna of Nav Public School, Indore.

(3 Marks)

OR

You are Ram/Rama. Draft a classified advertisement, in not more than 50 words, to be published in Hindustan Times for the sale of a used motor car giving all the necessary details.

2. The literary club of your school is putting up the motivational story 'Thinking Out of the Box'. As secretary of the club, draft a formal invitation inviting the famous writer Ruskin Bond to be the guest of honour at the function. Write the invitation in not more than 50 words. You are Rakshit/Rakshita of Vibgyor Public School, Pune.

(3 Marks)

OR

You are Girish of 78-C, Sector-12, Income Tax Colony, Thane. You have received an invitation for your friend Harit's daughter's wedding. Write an informal reply accepting the invitation in about 50 words.

3. Write a letter to the editor of a national newspaper in 120-150 words on the state of unemployment in the country. Give your suggestions too to solve the problem. You are Pratyush, 345, Mayur Vihar, Noida.

(5 Marks)

OR

You came across an advertisement in 'The Times of India' regarding the post of a graphic designer in Mumbai. Draft an application in about 120-150 words for the post of the same in response to the advertisement giving your resume. You are

Darshan/ Darshana of 34, Thakur Complex, A Wing, Kandivli, Mumbai.

XYZ edia
Graphic Designer Required

Needed young and dynamic graphic designer to create engaging and on-brand graphics for a variety of media at XYZ Media. Candidates should possess a creative flair and the ability to convert requirements into design along with an outgoing personality and good communication skills.

Apply within 5 days of the advertisement to the H R Manager

4. You are Sumit/ Sumita. Write an article in 120-150 words on the topic "Grow More Trees to Reduce Pollution "for your school magazine. You may use the cues given below along with your own ideas.

(5 Marks)

- Increase of pollution
- Cutting down of trees
- Increase of respiratory diseases because of the lack of oxygen
- Benefits of trees
- Human's dependency on trees for survival

Cultural Society Daisy Public School, Vellore organized an adult literacy camp in its neighbourhood. Write a report in 120-150 words on the camp for your school letter. You are Rakesh Nair, Secretary. You may use the cues given below along with your own ideas

- Date of the camp
- Location of the camp
- Number of volunteers
- Atmosphere of the camp
- Amenities provided to the participants

LITERATURE

5. Answer any five of the following questions in 30-40 words: (5 x 2 = 10)

(a)Why was Franz not scolded that day when he reached late without being prepared for participles?

(b)Why was the crofter so talkative and friendly with the peddler?

©How did Douglas make sure that he had conquered the terror of water?

(d)According to the poet Keats, what are the things that cause pain?

(e)Why are the tigers of aunt Jennifer described as denizens of a world of green?

(f)How did Kamala Das put away the thought of her mother's old age?

6. Answer any two of the following questions in 30-40 words: (2 x 2 = 4)

(a)Why did Jack insist that it was the wizard that was hit and not the mother?

(b)How did Mr. Lamb pass his leisure time?

©What is being inferred from Sam's letter to Charley?

7. Answer any one of the following in 120-150 words: (1 x 5 = 5)

How did the peddler feel after robbing the crofter? What course did he adopt and how did he react to the new situation? What does his reaction highlight?

OR

Douglas fully realized the truth of Roosevelt's statement, "All we have to fear is fear itself." How did this realization help him push aside his fear and become an expert swimmer?

8. Answer any one of the following in 120-150 words: (1 x 5 = 5)

In the modern world, one feels depressed, displayed, fear, insecurity and anxiety. Do you think that the third level was the medium of escape for Charley?

OR

Why did Jo disapprove of Jack's ending of the story of Roger Skunk? How did she want it to end?

Class XII
INFORMATICS PRACTICES (065)
SAMPLE QUESTION PAPER (2020 - 21)

Max Marks: 70 Time: 3 hrs

General Instructions:

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A has 2 sections:
   a. Section – I is short answer questions, to be answered in one word or one line.
   b. Section – II has two case studies questions. Each case study has 4 case-based subparts. An examinee is to attempt any 4 out of the 5 subparts.
4. Part - B is Descriptive Paper.
5. Part- B has three sections
   a. Section-I is short answer questions of 2 marks each in which two questions have internal options.
   b. Section-II is long answer questions of 3 marks each in which two questions have internal options.
   c. Section-III is very long answer questions of 5 marks each in which one question has question has internal option.

	PART A	
	Section - I **Attempt any 15 questions from questions 1 to 21**	
Q.No.	Questions	**Mark**
1	Name the attribute that returns the number of elements of a Series. a. Series.itemsize b. Series.shape **c. Series.size** d. Series.values	**1**
2	In a DataFrame, axis= 1 ,represents the_____ elements. a. Rows b. Plot **c. Columns** d. Graph	**1**
3	Which of the following is not an operating system? **a. GNU** b. Firefox c. BOSS d. Linux	**1**
4	Which clause is similar to “HAVING” clause in Mysql?	**1**

	a. SELECT **b. WHERE** c. FROM d. None of the above	
5	Small bits of data stored as text files on a browser. a. WebPage b. Web Browser c. Firewall **d. Cookies**	**1**
6	"COUNT" keyword belongs to which categories in Mysql? **a. Aggregate functions** b. Operators c. Clauses d. All of the mentioned	**1**
7	A Primary key column a. Can have NULL values b. Can have duplicate values c. Both (a) and (b) d. Neither (a) nor (b)	**1**
8	…….. describes the number of data points that fall within a specified range of values in histogram **bins**	**1**
9	Name the function that we need to save a plot with matplotlib **savefig()**	**1**
10	An act of stealing others Intellectual Property without their consent of without citing the source is called **Plagiarism**	**1**
11	Which of the following is NOT an intellectual property? a. A poem written by a poet b. An original painting made by a painter c. Trademark of a Company **d. A remixed song**	**1**
12	_____ method in Pandas can be used to change the index of rows and columns of a Series or Dataframe : a. rename()	**1**

	b. reindex() c. reframe() d. none of the above	
13	Cyber attack that uses disguised email as a weapon a. Spamming **b. Phishing** c. Hacking d. Bulling	**1**
14	The result of an arithmetic operation between Series of different index will result in a. Union **b. NaN** c. Will display error d. all of the Mentioned	**1**
15	….. is defined as discarded computers, office electronic equipment, mobile phones etc **Ewaste**	**1**
16	Which function is used to find most often appeared value from a set of numbers? a. mean() **b. mode()** c. median() d. count()	**1**
17	It is a device that connects dissimilar networks. a. Repeater b. Switch c. Firewall **d. Gateway**	**1**
18	Name the network device that amplifies signals transmitted on the network **Repeater**	**1**
19	The network device that converts digital signal to analog signal and vice versa. a. Repeater b. Switch **c. Modem** d. Gateway	**1**
20	We can delete an element from a series using	**1**

	a. empty() b. delete() c. rsub() **d. drop()**	
21	Online _____ is the theft of personal information in order to commit fraud. **Identity Theft**	**1**
	SECTION - II **Both the case study based questions (22 & 23) are compulsory. Attempt any four sub parts from each question. Each sub question carries 1 mark .**	
Q.No.	**Questions**	**Mark**
22	DataFrame is already created here. Write the answer for **any four** questions from (i)-(v) mentioned below. import pandas as pd data = {'name': ['James', 'Anna', 'Janet', 'Yogi', 'Robin', 'Amal', 'Mohan'], 'city': ['Mexico City', 'Toronto', 'Prague', 'Shanghai','Manchester', 'Cairo', 'Osaka'], 'age': [41, 28, 33, 34, 38, 31, 37], 'score': [88.0, 79.0, 81.0, 80.0, 68.0, 61.0, 84.0]} row_labels = [101, 102, 103, 104, 105, 106, 107] df = pd.DataFrame(data=data, index=row_labels) print(df)	
i.	Display the city of all the students. (i) print(df['city']) (ii) print(df.city) (iii) print(df.iloc[:,1]) (iv) print(df.iloc[:,0]) **Choose the correct answer** a. Both (i) and (ii) b. (i),(i),and (ii) c. Only (iv) d. All of the above	**1**
ii.	Display the city, age and score of all the students. (i) print(df('city','age','score'()	**1**

	(ii) print(df.iloc[1:4]) (iii) print(df[['city','age','score']]) (iv) print(df.iloc[:,1:4]) **Choose the correct statement** a. Both (i) and (ii) b. Only (iii) c. Both(iii) and (iv) d. Only (iv)	
iii.	Display the details of the student 103 (i) print(df.loc[103,1]) (ii) print(df.loc[103]) (iii) print(df.loc[103,:]) (iv) print(df.iloc[2,:]) **Choose the correct statement** a. (ii) , (iii) and (iv) b. Only (iii) c. Both(iii) and (iv) d. Only (iv)	**1**
iv.	Display the details of the students 104 to 107 print(df.loc[104:107]) print(df.iloc[3:]) print(df.iloc[104:107]) print(df.loc[3:]) **Choose the correct statement** a. Only (iii) b. Both (i) and (iii) c. Both(iii) and (iv) d. Only (iv)	**1**
v.	Display the city in which Robin lives. (i) print(df.city[105]) (ii) prin(df.iloc['Robin']) (iii) print(df.iloc[4,1:2]) (iv) print(df.city['Robin']) **Choose the correct statement** a. (i),(iii),(iv) b. Both (i) and (iii) c. Both(ii) and (iii) d. All of the above	**1**

23 Mr. Manav, a database administrator in "Global Educational and Training Institute" has created following table named "Training" for the upcoming training schedule:

Training

Training_Id	Name	Email_Id	Topic	City	Fee
ND01	Mr. Rajan	raj@gmail.com	Cyber Security	New Delhi	10000
GU01	Ms. Urvashi	urv@yahoo.com	ICT in Education	Gurugram	15000
FD01	Ms. Neena	neenarediff.com	Cyber Security	Faridabad	12000
ND02	Mr. Vinay	NULL	ICT in Education	New Delhi	13000
GU02	Mr. Naveen	nav@gmail.com	Cyber Security	Gurugram	NULL

Help him in writing SQL query for the following purpose:

(i)	To count how many female candidates will be attending the training.	**1**
(ii)	To display list of free trainings.	**1**
(iii)	To display all the cities where Cyber Security training is scheduled along with its fee.	**1**
(iv)	To add a column feedback with suitable data type	**1**
(v)	Help Manav to write the command to display the name of the candidate paying minimum fee.?	**1**
	PART – B	
	SECTION I	
24	Ms. Anushka , recently discovered that communication between her administrative office and HR office is extremely slow and signals drop quite frequently. These offices are 125 meters away from each other and connected by an Ethernet cable. (i) Suggest her a device, which can be installed in between the offices for smooth communication. (ii) What type of network is formed by having this kind of connectivity out of LAN,MAN, and WAN?	**2**

25	There is a column C1 in a table T1. The following two statements: SELECT COUNT(*) FROM T1; and SELECT COUNT(C1) from T1; are giving different outputs. What may be the possible reason?	**2**
26	What is hacking? What is the difference between hacking and cracking ?	**2**

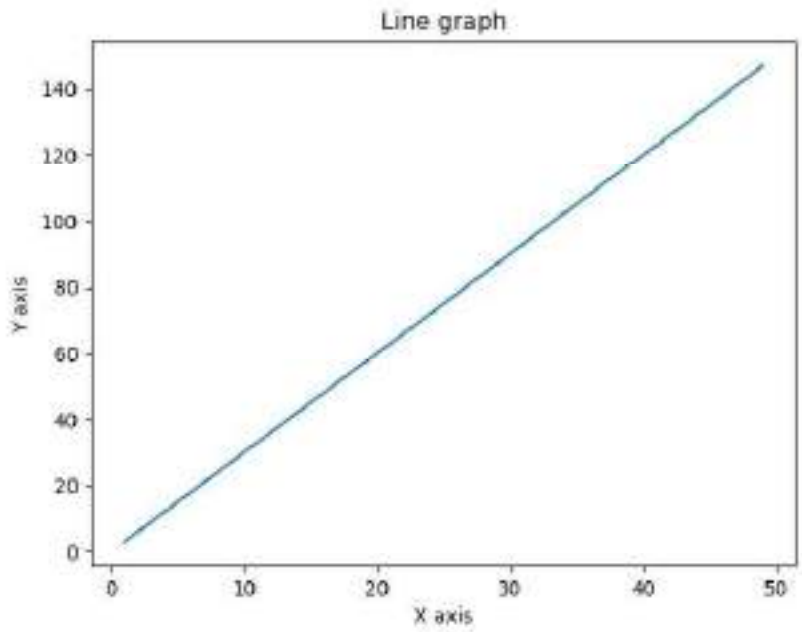
27	Consider the given 2 series
	`>>> s`
	`1 2`
	`2 4`
	`3 6`
	`4 8`
	`dtype: int64`
	`>>> s1`
	`1 10`
	`2 20`
	`3 30`
	`5 40`
	`dtype: int64`
	Write the output after doing the mathematical operations
	`>>> s+s1` ii. . `>>> s*s1`
		2

28	Consider the following Series **S** with index as **item name** and values as **item price**
	`Soap 250`
	`Handwash 400`
	`Powder 300`
	`Facewash 500`
	`Comb 100`
	`dtype: int64`
	i. Write the command to display the name of the item having price<200.
	ii. Write the command to give name to the index as 'itemname'.
		2

29	A college is considering networking with 75 stand-alone computers,2 printers, 1 scanner and adding a server. State 2 advantages of doing this. **OR** What is the difference between static and dynamic web pages?	**2**

30	Write a program in Python Pandas to create the following DataFrame for a Competition from a **Dictionary**:
	`Chest_No Name Event1 Event2`
	`0 110 Gouri 90 80`
	`1 240 Sharma 65 45`
	`2 325 Anupama 70 95`
	`3 101 Krishna 80 76`
	Perform the following operations on the DataFrame :
	i. Add both the Event1 and Event2 points of participants and assign to column "Total" and display the DataFrame.
	ii. Display the highest point in Event1 and lowest point of Event2 and display the DataFrame.
		2

31	For the given DataFrame df, write python statements to sort the DataFrame on ascending order of points. |	House	Year	Points | |---|---|---|---| | 0 | Raman | 2010 | 500 | | 1 | Tagore | 2010 | 600 | | 2 | Raman | 2011 | 300 | | 3 | Tagore | 2011 | 400 | | 4 | Ashok | 2010 | 500 | OR Hitesh wants to display the last four rows of the DataFrame df and has written the following code : >>df.tail() But last 5 rows are being displayed. Identify the error and rewrite the correct code so that last 4 rows get displayed.	**2**
32	Write down the difference between Shareware and Freeware. Give one example each	**2**
33	Mrs. Sharma is the class teacher of Class 'VII A' She wants to create a table 'Student' to store details of her class. (i) Which of the following can be the attributes of Student table? a) RollNo b) "Amit" c) Name d) 25 ii) Name the Primary key of the table 'Student'. State reason for choosing it.	**2**
	SECTION – II	
34	What will be the output of the following code: import matplotlib.pyplot as p x=[6,7,8,9,10] y=[60,40,55,30,70] p.title('Secondary Class Strength') p.xlabel('Class') p.ylabel('No. of students') p.bar(x,y) p.show() **OR** Write a program to draw **line charts** for the following with suitable label in the X-axis, Y-axis and a title. Show the unemployment rate from 1930 to 2020 Year = [1930,1940,1950,1960,1970,1980,1990,2000,2010,2020] Unemployment_Rate = [9.8, 12, 8, 7.2, 6.9, 7, 6.5, 6.2, 5.5, 9.3]	**3**

35	Write a Pyhton program to draw a line with a suitable label in the X axis and Y axis and a title. The code snippet gives the output shown in the following screenshot.  OR Write a python program to draw a histogram with following information: 10 15 10 10 10 15 20 20 20 20 20 25 25 The histogram should have following information a) X-axis label should be score and Y-axis should be Frequency b) The title should be Frequency of Score c) The colour of histogram should be cyan with 10 bins Use proper import statements in the program	**3**
36	Consider the following **TEACHER** table: Write SQL commands for (i) and (ii) output for (iii). Tid | TName | Department | Salary | Noof Periods 100 | Joseph | Physics | 45000 | 25 101 | Lakshmi | Hindi | 55000 | 25 102 | Neelu | Chemistry | 66000 | 103 | John | Physics | 40000 | 25 (i) To display the details of Teacher table in ascending order of Salary. (ii) To display the TNAme in ascending order of teacher's name. (iii) SELECT avg(NoofPeriods) from Teacher;	**3**

37 On the basis of '**Student**" table below answer the questions : **3**

RollNo	Name	Class	DOB	Gender	City	Marks
1	Nanda	X	06-06-1995	M	Agra	551
2	Saurabh	XII	07-05-1993	M	Mumbai	462
3	Sanal	XI	06-05-1994	F	Delhi	400
4	Trisla	XII	08-08-1995	F	Mumbai	450
5	Store	XII	08-10-1995	M	Delhi	369
6	Marisla	XI	12-12-1994	F	Dubai	250
7	Neha	X	08-12-1995	F	Moscow	377
8	Nishant	X	12-06-1995	M	Moscow	489

i) Give output of following SQL
SELECT GENDER, COUNT(*) FROM STUDENT GROUP BY GENDER;

ii) Find the Degree and Cardinality of the table.

iii) Write SQL to display different Cities available in table.

SECTION – III

38 Write SQL (i) to (iii) and output for (iv) and (v) based on following table : **5**

Table: Emp

EMPNO	ENAME	JOB	HIREDATE	SAL	COMM	DEPTNO
7566	JONES	MANAGER	02-Apr-81	2975	NULL	20
7654	MARTIN	SALESMAN	28-Sep-81	1250	1400	30
7698	BLAKE	MANAGER	01-May-81	2850	NULL	30
7782	CLARK	MANAGER	09-Jun-81	2450	NULL	10
7788	SCOTT	ANALYST	09-Dec-82	3000	NULL	20

i) To list the Employee Name who are not getting any commission(COMM).

ii) Display Name of Employee whose name start with character 'A'.

iii) To count number of Jobs available in company i.e. in EMP table.

iv) SELECT ENAME, SAL*10 FROM EMP WHERE DEPTNO=10;

v) SELECT YEAR(HIREDATE) FROM EMP WHERE DEPTNO=20 AND JOB='ANALYST'

39 Create a DataFrame as shown below. **5**

```
import pandas as pd
sales=pd.DataFrame({'2015':[256,452,635,965],'2016':[745,785,478,547],'2017':[452,474,725,854],'2018':[1021,958,528,425]},
index=['Qtr1','Qtr2','Qtr3','Qtr4'])
print(sales)
```

Write the code for the following questions:

(i) Display the first three rows of the DataFrame.

(ii) Display the sales in 2015, 2016 and 2017 in Quarters 1 and 2.

(iii) Display the indices of the DataFrame.

(iv) Display the column labels.

(v) Add a new column 2019 with values[524,639,785,458]for all quarters

OR

Create a data frame with dictionary with keys as 'DATA1' and 'DATA2. Their values are [12,-55,67,78,nan,-44] and [56,-78,89,-90,nan,87] respectively.

Replace all negative values with zero and all NaN with 999. Display the resultant DataFrame.

Remove the first row and display the new DataFrame.

40 Consider the tables given below **5**

Table: Employee

No(Primary key)	Name(not null)	Salary	Zone	Age	Grade	Dept
1	Mukul	30000	West	28	A	10
2	Kritika	35000	Centre	30	A	10
3	Naveen	32000	West	40	NULL	20
4	Uday	38000	North	38	C	30
5	Nupur	32000	East	26	NULL	20
6	Moksh	37000	South	28	B	10
7	Shelly	36000	North	26	A	30

(i) Display the various department numbers from the table Employee. A department number should be displayed only once

(ii) Display the details of all the employees whose names contain ‘a’ as the second character.

(iii) Display the highest and the lowest salaries being paid in department 10.

(iv) Display the number of employees working in department 10.

(v) Display the average age of employees in each department only for those departments in which average age is more than 30.

Kochi Metro Sahodaya
Model Question Paper

MATHEMATICS

Grade: XII **Time: 3 hours**

Marks: 80

General Instructions:

1. This question paper contains two parts **A** and **B** . Each part is compulsory. Part A carries **24** marks and Part B carries **56** marks.
2. **Part-A** has Objective Type Questions and **Part -B** has Descriptive Type Questions
3. Both Part A and Part B have choices.

Part – A:

1.It consists of two sections **I** and **II**

2. Section **I** comprises of 16 very short answer type questions of **1** mark each.

3. Section **II** contains **2** case studies. Each case study comprises of 5 case-based MCQs. An examinee is to attempt **any 4 out of 5 MCQs** .

Part – B:

1. It consists of three sections- **III, IV and V.**
2. Section **III** comprises of 10 questions of **2 marks** each**.**
3. Section **IV** comprises of 7 questions of **3 marks** each**.**
4. Section **V** comprises of 3 questions of **5 marks** each**.**
5. Internal choice is provided in **3** questions of Section **–III**, **1** question of Section-**IV** and **3** questions of Section-**V**. You have to attempt only one of the alternatives in all such questions .

Part –A

Section I

All questions are compulsory . In case of internal choices attempt any one .

1. Find the number of non-reflexive relations defined on a set with three elements.

OR

Let R be the relation defined on Q (the set of rational numbers) as a R b $\Leftrightarrow |a-b| \leq \frac{1}{2}$.

Then state the reason why R is not a transitive relation ?

2. If A , B and C are matrices of order 4 x 3, 5 x 4 and 3 x 7 respectively , then find the order of $C^1(A^1 \times B^1)$

OR

For what value of x , is the matrix A = $\begin{bmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ x & -3 & 0 \end{bmatrix}$ a skew symmetric matrix ?

3. Evaluate $\int \frac{dx}{e^x + e^{-x}}$ dx

OR

If f(x) = $\int_0^x t\ sint\ dt$, then write the value of $f^I(x)$.

4. Find the area of the region bounded by the curve $y = x^2$ and the line y = 4 .

5. If $(\vec{a} \times \vec{b})^2 + (\vec{a} . \vec{b})^2$ =225 and $|\vec{a}|$ =5 then write the value of $|\vec{b}|$

6. Find the order and degree of the differential equation $x^2 \frac{d^2y}{dx^2} = \left\{1 + (\frac{dy}{dx})^2\right\}^4$

OR

Find the general solution of the differential equation $\log(\frac{dy}{dx}) = 2x + y$

7. Write the vector equation of the plane, passing through point (a,b,c) and parallel to the plane $\vec{r}.(\hat{\imath} + \hat{\jmath} + \hat{k}) = 2$.

OR

If $\vec{a}$ and $\vec{b}$ are two unit vectors such that $\vec{a} + \vec{b}$ is also a unit vector, then find the angle between $\vec{a}$ and $\vec{b}$.

8. Evaluate $\cos^{-1}\left(\cos\frac{11\pi}{6}\right)$?

9. The relation R on set A of all lines in a plane defined as R = $\{(l_1, l_2 \in A \times A; l_1 is\ parallel\ to\ l_2\}$ is an equivalence relation . Write the equivalence class related to the line 2y = 5x + 7.

10. If for any 2 × 2 square matrix A , A(adj A) = $\begin{bmatrix} 8 & 0 \\ 0 & 8 \end{bmatrix}$, then write the value of $|A|$.

11. If A and B are square matrices of the same order 3 , such that $|A|$= 2 and AB = 2 I , Write the value of $|B|$. .

12. If $\vec{a} = 2\hat{\imath} - \hat{\jmath} + 3\hat{k}$ and $\vec{b} = 6\hat{\imath} + \lambda\hat{\jmath} + 9\hat{k}$ and $\vec{a}$ is parallel to $\vec{b}$, then find the value of λ .

13. If P(not A) = 0.7 , P(B) = 0.7 and P $\left(\frac{B}{A}\right) = 0.5$, then find P $(\frac{\bar{A}}{B})$.

14. Find the distance between the planes 2x-y +2z =5 and 5x – 2.5 y + 5z = 20 .

15. If a line makes angles 90º , 135º , 45º with x , y and z axis respectively , find its direction cosines.

16. A die is thrown once if odd number turns up , what is the probability that die shows a prime number .

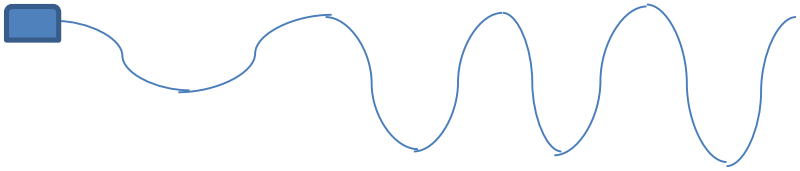
Section II

Both the case study based questions are compulsory. Attempt any 4 sub parts from each question (17-21) and (22-26). Each question carries 1 mark.

17. Raj is playing with a spring by throwing it in the air which is moving along the function :

$f(x) = 3x^4 - 4x^3 - 12x^2 + 5$

Spring



From the given case study, answer of the following questions.

(i) Find the critical point of x which it touches the x-axis :

(a) 0,1,2 (b) 0, -1,2 (c) 0, 1, -2 (d) 1,2,-2

(ii) Find the interval in which string in which spring is strictly increasing.

(a) $(-1, 0) \cup (2, \infty)$ (b) $(1, 0) \cup (2, \infty)$ (c) $(1, \infty)$ (d) $(0, \infty)$

(iii) Find the interval in which string in which spring is strictly decreasing.

(a) $(-\infty, -1) \cap (0, 2)$ (b) $(-\infty, -1) \cup (0, 2)$ (c) $(-\infty, 2)$ (d) $(-1, 2)$

(iv) Find the values of x at which spring has local maxima.

(a) 2 (b) -1 (c) 1 (d) 0

(v) What is the maximum height caused by spring?

(a) 10 (b) 72 (c) 5 (d) 0

18. Meghana has two boxes I and II . Box I contains 3 red and 6 black balls . Box II contains 5 red and ‘n ‘black balls .One of the two boxes , box I and box II is selected by her friend Radha at random , then Radha draws a ball at random . The ball drawn is found to be red .
Based on the above information answer the following.

(i) Meghana notices the probability of the red ball taken out from the box II is $\frac{3}{5}$. Then Radha ask her about the value of n . The value of n is
(a) 1 (b) 3 (c) 5 (d) 6

(ii) The probability that box I is selected given that the ball drawn is found to be red , is

(a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{3}{5}$ (d) 1

(iii) What is the probability that the ball drawn is found to be red

(a) $\frac{5}{12}$ (b) $\frac{7}{12}$ (c) $\frac{5}{21}$ (d) $\frac{12}{5}$

(iv) Let A be the event of getting a red ball from the box . Also let E1 and E 2 be the events that the box I and the box II is selected respectively. The value of $\sum_{i=1}^{i=2} P(\frac{Ei}{A})$ is

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) 0

(v) Refer to (iv) part . The value of $\sum_{i=1}^{i=2} P(Ei)$ is

(a) 0 (b) $\frac{1}{2}$ (c) 1 (d) $\frac{1}{10}$

Part – B

Section III

All questions are compulsory. In case of internal choices attempt any one

19. Simplify $\cot^{-1}\sqrt{\frac{1-\cos x}{1+\cos x}}$ - $\tan^{-1}\frac{1-\sin x}{\cos x}$, where $0 < x < \frac{\pi}{2}$

20. Given A = $\begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$, Compute A^{-1} *and show that* $2A^{-1} = 9I - A$

OR

If A = $\begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$, then find the value of k such that $A^{-1} = k\,A$

21. If $x^y = e^{x-y}$, prove that $\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$.

22. Prove that the curves $y^2 = 4ax$ and $xy = c^2$ cut at right angles , if $c^4 = 32\,a^4$.

23. Evaluate $\int \frac{sinx+cosx}{\sqrt{sinx\ cosx}}\,dx$

24. Find the area bounded by the curve y = 3x , x –axis and between the ordinates x = 1 and x= 3

OR

Find the area between $x = y^2$ and x= 4 is divided into two equal parts by line x= a . Find the value of a .

25. Solve the differential equation $(1+ e^{2x})\,dy + (1 + y^2)\,e^x\,dx = 0$ given that when x = 0 , y =1

26. Find the image of the point (1,0,0) on the line $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$

27. Using vectors , show that the points A (1, 2, 7), B (2, 6, 3) and C (3, 10 ,-1) are collinear .

28. An instructor has a question bank consisting of 300 easy true/ false questions , 200 difficult , 500 easy multiple choice questions and 400 difficult multiple choice questions .If a question is selected at random from the question bank what is the probability that it will be an easy question given that it is a multiple choice question .

OR

A card is drawn from a well shuffled deck of 52 cards . The outcome is noted , the card is replaced and the deck reshuffled . Another card is drawn from the deck. What is the probability that the first card is an ace and the second card is a red queen .

Section IV

All questions are compulsory. In case of internal choices attempt any one

29. Consider $f : R_+ \to [-5 , \infty)$ given by $f(x) = 9x^2 + 6x - 5$. Prove that f is one –one and onto.

30. If x sin (a + y) + sin a cos (a + y) = 0 , prove that $\frac{\sin^2(a+y)}{sina} = \frac{dy}{dx}$

OR

If $x = 2a\cos^3\theta$ and $y = 3a\sin^2\theta$, find $\frac{d^2y}{dx^2}$ at $\theta = \frac{\pi}{6}$

31. Find a point on the curve $y = x^3 - 11x + 5$ at which the equation of the tangent is y = x - 11 .

32. Show that the height of a closed right circular cylinder of given surface and maximum volume is equal to the diameter of its base .

33. Evaluate $\int \frac{x^2+1}{(x^2+4)(x^2+25)}$ dx

34. Find the value of k so that the following function is continuous at y = 2

$$f(y) = \begin{cases} \frac{y^3+y^2-16y+20}{(y-2)^2}, & y \neq 2 \\ k \quad , & y = 2 \end{cases}$$

35. Solve the differential equation ;

$2x^2 \frac{dy}{dx} - 2xy + y^2 = 0$

Section V

All questions are compulsory. In case of internal choices attempt any one.

36. Use the product $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}\begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ to solve the system of equations x+3z = 9 , - x + 2y - 2z = 4, 2x -3y + 4z = -3.

OR

Let A = $\begin{bmatrix} 2 & 3 & 10 \\ 4 & -6 & 5 \\ 6 & 9 & -20 \end{bmatrix}$,find A^{-1}. Using A^{-1} solve the system of equations

$\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 2$; $\frac{4}{x} + \frac{6}{y} + \frac{5}{z} = 5$; $\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = -4$

37. Find the distance of the point (-1 , -5 ,-10) from the point of intersection of the line $\vec{r} = 2\hat{\imath} - \hat{\jmath} + 2\hat{k} + \lambda(3\hat{\imath} + 4\hat{\jmath} + 2\hat{k})$ and the plane $\vec{r}.(\hat{\imath} - \hat{\jmath} + \hat{k}) = 5$.

OR

Find the equation of the plane through the line of intersection of planes x +y + z = 1 and 2x +3y +4z = 5 which is perpendicular to the plane x - y + z = 0 . Also find the distance of the plane obtained above from the origin.

38.Use the graphical method to solve linear programming problem:

To minimise : $Z = 2x + y$

Subject to constraints: $x \geq 0$, $y \geq 0$, $4x+y \geq 80$, $x + 5y \geq 115$, $3x + 2y \leq 150$. Also write the point at which maximum value of Z occurs .

OR

A manufacturer has employed five skilled men and ten semi - skilled men and makes two models A and B of an article. The making of one item of model A requires two hours work by a skilled man and two hours work by a semi-skilled man. One item of model B requires one hour by a skilled man and three hours by a semi-skilled man. No man is expected to work more than 8 hours per day. The manufacturer's profit on an item of model A is ₹15. and on an item of model B is ₹ 10 . How many of items of each model should be made per day in order to maximize daily profit? Formulate the above LPP and solve it graphically and find the maximum profit.

KOCHI METRO SAHODAYA MODEL EXAMINATION

CLASS XII

PHYSCIS

Maximum Marks : 70

Time allotted: 3 hours

(1) All questions are compulsory. There are 33 questions in all.

(2) This question paper has five sections: Section A, Section B, Section C, Section D and Section E.

(3) Section A contains ten very short answer questions and four assertion reasoning MCQs of 1 mark each, Section B has two case-based questions of 4 marks each, Section C contains nine short answer questions of 2 marks each, Section D contains five short answer questions of 3 marks each and Section E contains three long answer questions of 5 marks each.

(4) There is no overall choice. However internal choice is provided. You have to attempt only one of the choices in such questions.

$c = 3 \times 108$ m/s

$h = 6.63 \times 10^{-34}$ Js

$e = 1.6 \times 10^{-19}$ C

$\mu_0 = 4\pi \times 10^{-7}$ T m A^{-1}

$\varepsilon_0 = 8.854 \times 10^{-12}$ C^2 N^{-1} m^{-2}

$\frac{1}{4\pi\epsilon_0} = 9 \times 10^9$ N m^2 C^{-2}

All questions are compulsory. In case of internal choices, attempt any one of them.

Section – A

1.Draw the equipotential surface due to an electric dipole

1

2. Name the most energetic electromagnetic radiation and write its frequency range.

OR

Which physical quantity is the same for X-rays of wavelength 10^{-10}m, Red light of wavelength 6800A^o Radio waves of wavelength 500nm?

1

3. A magnetic field that varies in magnitude from point to point but has a constant direction (east to west) is set up in a chamber. A charged particle enters the chamber and travels undeflected along a straight path with constant speed. What can you say about the direction of initial velocity of the particle?

1

4.An alternating emf from a source is given by V = 314 sin 314t. What is the rms value of emf and angular frequency of the source?

OR

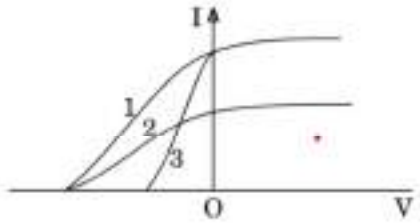
An a.c voltage source of variable angular frequency ω and fixed amplitude V_o is connected in series with a Capacitance C and an electric bulb of resistance R(inductance zero). What happens to the brightness of the bulb when angular frequency is increased.

1

5.The short wavelength limits of the Lyman, Paschen and Balmer series , in the hydrogen spectrum , are denoted by λ_L, λ_P, λ_B. . Arrange these wavelengths in the ascending order.

1

6. The three curves shown below, represent the variation of photocurrent and applied voltage for two different materials using two different intensities of a monochromatic light. Identify the two curves which are for the same material.



1

7. Two nuclei have mass numbers in the ratio 1: 2. What is the ratio of their nuclear densities?

OR

Two nuclei have mass numbers in the ratio 1 : 8. What is the ratio of their radii?

1

8.What type of extrinsic semi conductor is formed when (i) Silicon is doped with Bismuth (ii) Germanium is dopped with Gallium.

OR

Give the ratio o number of holes and number of conduction electrons in an intrinsic semiconductor

1

9. State the reason, why GaAs is most commonly used in making of a solar cell.

1

10.Why should care be taken that high reverse current do not appear across LED?

1

For question numbers 11, 12, 13 and 14, two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

a) Both A and R are true and R is the correct explanation of A

b) Both A and R are true but R is NOT the correct explanation of A

c) A is true but R is false

d) A is false and R is also false

11. **Assertion (A):**

If the distance between the parallel plates of a capacitor is halved and dielectric constant is made three times, then the capacitance becomes six times

Reason (R):

The potential of the capacitor depends on the charge given to it

1

12. **Assertion (A):**

Electrostatic field lines start at positive charges and end at negative charges

Reason (R):

Filed lines are continuous curves without any breaks and they form closed loops 1

13. **Assertion (A):**

If the angles of the base of the prism are equal, then in the position of minimum deviation, the refracted ray will pass parallel to the base of the prism.

Reason (R):

In the case of minimum deviation, the angle of incidence is equal to the angle of emergence.

1

14. **Assertion (A):**

Thin films such as soap bubble or a thin layer of oil on water show beautiful colours when illuminated by white light.

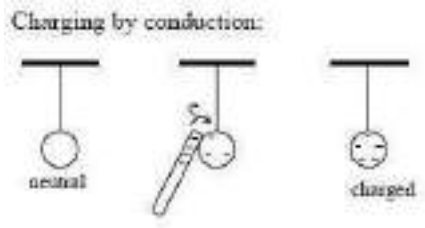
Reason (R):

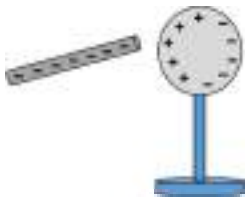
It is due to interference of sun's light reflected from upper and lower surfaces of the film.

Section – B

Questions 15 and 16 are Case Study based questions and are compulsory. Attempt any 4 sub parts from each question. Each question carries 1 mark.

15. Charging by conduction involves the contact of a charged object to a neutral object. Hence when an uncharged conductor is brought in contact with a charged conductor, charge is shared between the two conductors equally and hence the uncharged conductor gets charged. During charging by conduction, both objects acquire the same type of charge. In charging by induction, a charged object is brought near but not touched to a neutral conducting object. The presence of a charged object near a neutral conductor will induce (force) electrons within the conductor to move. The movement of electrons leaves an imbalance of charge on opposite sides of the neutral conductor. While the overall object is neutral (i.e., has the same number of electrons as protons), there is an excess of positive charge on one side of the object and an excess of negative charge on the opposite side of the object.




charging by induction

1. Which of the following material can be charged by induction
   a) Plastic
   b) Glass
   c) Copper
   d) Wood

2. If the charged on the rod shown in the first set of figures is -10C, what will be the final charge on the sphere after getting charged by conduction

   a) -10C
   b) +10C
   c) -5C
   d) -20C

3.If the far end of the sphere shown in the second figure is earthed and then disconnected from the ground, what will be the nature of the final charge on the sphere?

a) Positive
b) Negative
c) Neutral
d) Positive on one side and negative on the other side.

4. Two electrically charged spheres, having charges of different magnitudes, placed at a distance 'd' from each other, experience a force of attraction 'F' . These two particles are put in contact and again placed at the same distance from each other. What is the nature of new force between them?

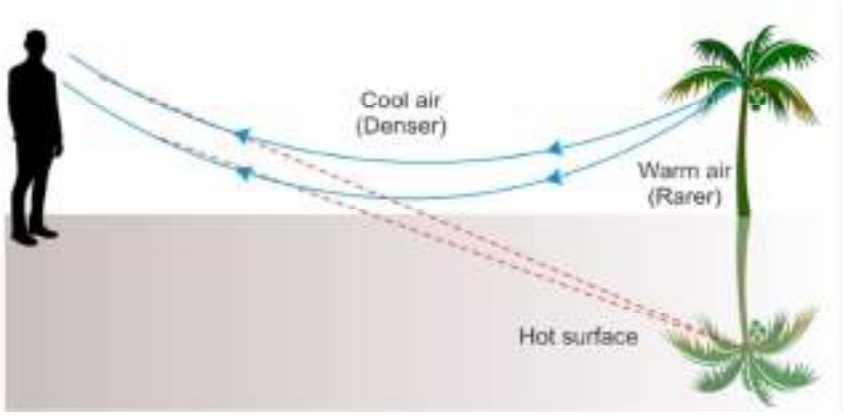
a) Attractive
b) Repulsive
c) No force
d) Both attractive and repulsive

5. A and B are two metallic spheres having identical sizes and charge Q on each. A third charge C of the same size is brought in contact with the first, then brought in contact with the second and finally removed from both. What is the new charge on C?

a) 3Q/2
b) Q/2
c) Q/4
d) 3Q/4

(4 x 1 = 4)

16. Mirage is an optical phenomenon that creates the illusion of water and results from the refraction of light through a non-uniform medium. Mirages are most commonly observed on sunny days on tarred road or on desert areas. On hot summer days the air near the ground becomes hotter than the air at higher levels. Hot air tends to be less optically dense than cooler air. As a result, light from a tall object such as a tree, passes through a medium whose refractive index decreases towards the ground. Thus, a ray of light from such an object successively bends away from the normal and undergoes total internal reflection, if the angle of incidence for the air near the ground exceeds the critical angle. To a distant observer, the light appears to be coming from somewhere below the ground. The observer naturally assumes that light is being reflected from the ground, say, by a pool of water near the tall object. Such inverted images of distant tall objects cause an optical illusion to the observer. This phenomenon is called mirage. The angle of incidence in the rarer medium corresponding to an angle of refraction 90º, is called the critical angle (i_c) for the given pair of media. For values of i larger than i_c, Snell's law of refraction cannot be satisfied, and hence no refraction is possible. The refractive index of denser medium 1 with respect to rarer medium 2 will be $\mathbf{n_{12}} = \frac{1}{\sin i_c}$



1.The optical illusion mirage takes place when light

a) goes from a rarer to a denser medium
b) goes from a denser to rarer medium
c) goes from a medium of refractive index n to another medium of refractive index n itself.
d) enters normally from one medium to another

2. When total internal reflection takes place the angle of incidence in the first medium should be

a) less than the critical angle

b) equal to critical angle

c) greater than the critical angle

d) equal to 90^0.

3. When angle of incidence is equal to critical angle, the angle of refraction is

a) 0^0

b) 90^0

c) $<90^0$

d) $> 90^0$

4. What is the speed of light in a medium whose critical angle is 45^0

a) 3×10^8 m/s

b) 2.1×10^8m/s

c) $3\sqrt{2} \times 10^8$ m/s

d 1.5×10^8m/s

5. Which of the following is not due to total internal reflection?

a) Working of Optical fibre

b) Apparent depth of a water tank

c) Brilliance of diamond

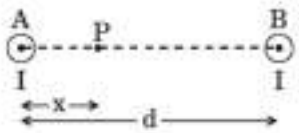
d) Mirage

(4 x 1 = 4)

Section – C

All questions are compulsory. In case of internal choices, attempt anyone.

17. Two long straight parallel wires A and B separated by a distance ***d,*** carry equal current ***I*** flowing in same direction as shown in the figure. (a) Find the magnetic field at a point P situated between them at a distance x from one wire. (b) Show graphically the variation of the magnetic field with distance x for **0 < x < d**.



2

18. Explain the following with reasons:

(i) When monochromatic light is incident on a surface separating two media, the reflected and refracted light both have the same frequency as the incident frequency.

(ii) When light travels from a rarer to a denser medium, the speed decreases. Does this decrease in speed imply a reduction in the energy carried by the wave?

OR

A plane wavefront propagating in a medium of refractive index n_1 is incident on a plane surface and enters into a medium of refractive index n_2. Use Huygens's wave theory construct the incident and refracted wavefronts and verify Snell's law.

2

19. Derive the expression for the energy stored in a parallel plate capacitor.

OR

An electric dipole is aligned parallel to the field. Find the work done in rotating it through an angle of 180^0.

2

20. In a ceiling fan, each blade rotates in a circle of radius 0·5 m. If the fan makes 2 rotations per second and the vertical component of the earth's magnetic field is 8×10^{-5} T, calculate the emf induced between the inner and outer ends of each blade.

2

21. Explain the formation of depletion region and potential barrier during the formation of a pn junction diode.

2

22. Draw the ray diagram to show use of total internal reflection in (i) optical fiber, and (ii) a prism that bends the ray by 90°.

2

23. At a place, the horizontal component of earth's magnetic field is B and the angle of dip is 60^0. What is the value of horizontal component of the earth's magnetic field at equator.

OR

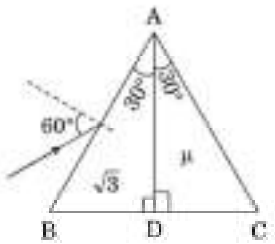
A compass needle, free to turn in a vertical plane orients itself with its axis vertical at a certain place on the earth. Find out the values of (i) horizontal components of earth's magnetic field and (ii) angle of dip at the place.

2

24.Name the optoelectronic device used for detecting optical signals and mention the biasing in which it is operated. Draw its I-V characteristics

2

25. A composite prism ABC is made up of two identical right-angled prisms ABD and ADC made up of different materials of refractive indices $\sqrt{3}$ and μ respectively. A ray of light is incident on face AB of this prism at 60° as shown in the figure. It is observed that the final emergent ray grazes along face AC. Find the value of μ.



2

Section -D

All questions are compulsory. In case of internal choices, attempt any one.

26. The given graphs (a) and (b) represent the variation of the opposition offered by the circuit element to the flow of alternating current, with frequency of the applied emf. Identify the circuit element corresponding to each graph. Give reason to support your answer. If these circuit elements are connected in series, obtain the expression for impedance of the combination.

(a) (b)

OR

A circuit is set up by connecting L = 100 mH, C = 5 pF and R = 100 Ω in series. An alternating emf of 150 √2 volt , $\frac{500}{\pi}$Hz is applied across this series combination. Calculate the impedance of the circuit. What is the average power dissipated in (a) the resistor (b) the capacitor

3

27. The thickness of a conductor continuously decreases from its one end (A) to another end (B). It is connected across the terminals of a battery. What will be the effect on the value of (a) electric field, (b) current density, and (c) mobility of the electron at a point on the conductor as one moves from end A to end B ?

OR

OR

Define relaxation time of the free electrons drifting in a conductor. How is it related to the drift velocity of free electrons? Use this relation to deduce the expression for the electrical resistivity of the material.

3

28.(a) Obtain the expression for the de Broglie wavelength of a charged particle accelerated through a potential V.

(b) A photon and an alpha particle are accelerated through the same potential. Which one of the two has (i) greater value of de Broglie wavelength.

3

29. Using Bohr's postulates, show that for an electron revolving in the nth orbit in hydrogen atom the (i) radius of the orbit is directly proportional to n^2, and (ii) total energy of the electron is inversely proportional to n^2.

3

30. (a)State Bohr's postulate to define stable orbits in hydrogen atom. How does de Broglie's hypothesis explain the stability of these orbits?

(b)State Bohr postulate of hydrogen atom that gives the frequency of emitted photon in a transition.

3

Section – E

All questions are compulsory. In case of internal choices, attempt

31.If two similar large plates, each of area A having surface charge densities $+\sigma$ and $-\sigma$ are separated by a distance d in air, find the expressions for

(a) field at points between the two plates and on outer side of the plates. Specify the direction of the field in each case.

(b) the potential difference between the plates.

(c) The capacitance of the capacitor so formed.

OR

(a) Define electric flux. Write its SI unit.

(b) Using Gauss's Theorem, prove that the electric filed at a point due to a a uniformly charged infinite plane sheet is independent of the distance from it.

(c) How is the field directed if (i) the sheet is positively charged, (ii) negatively charged?

5

32. What are eddy currents? How are they produced? In what sense eddy currents are considered undesirable in a transformer? How can they be minimised? Give two applications of eddy current.

OR

(a)Describe briefly , with the help of a labelled diagram, the working of a step up transformer.

(b)Write any two sources of energy loss in a transformer.

(c)A step up transformer converts a low voltage into high voltage. Does it not violate the principle of of conservation of energy? Explain.

5

33. (a) Can two independent monochromatic light sources be used to obtain a steady interference pattern ? Justify your answer.

(b) In a Young's double-slit experiment, explain the formation of interference fringes and obtain an expression for the fringe width.

(c) In an interference experiment using monochromatic light of wavelength λ, the intensity of light of a point, where the path difference is λ, on the screen is K units. Find out the intensity of light at a point when path difference is $\lambda/4$.

OR

Two harmonic waves of monochromatic light

$y_1 = a \cos \omega t$

$y_2 = a \cos (\omega t + \phi)$

are superimposed on each other. Show that maximum intensity in interference pattern is four times the intensity due to each slit. Hence write the conditions for constructive and destructive interference in terms of the phase angle,

5

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Kochi Metro Sahodaya

Model Question Paper

GRADE: XII **SUBJECT: PHYSICS**

General Instructions:

All questions are compulsory. There are 33 questions in all.

- This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
- Section A contains ten very short answer questions and four assertion reasoning MCQs of 1 mark each, Section B has two case-based questions of 4 marks each, Section C contains nine short answer questions of 2 marks each, Section D contains five short answer questions of 3 marks each and Section E contains three long answer questions of 5 marks each.
- There is no overall choice. However internal choice is provided. You have to attempt only one of the choices in such questions.
- You may use the following values of physical constants wherever necessary.

$c = 3 \times 10^8$ m/s	$1/4\pi\varepsilon_o = 9 \times 10^9$ N m^2 C^{-2}
$m_e = 9.1 \times 10^{-31}$ kg	$h = 6.63 \times 10^{-34}$ Js
mass of neutron $= 1.675 \times 10^{-27}$ kg	$e = 1.6 \times 10^{-19}$ C
mass of proton $= 1.673 \times 10^{-27}$ kg	$\mu_o = 4\pi \times 10^{-7}$ T mA^{-1}
$\varepsilon_o = 8.854 \times 10^{-12}$ C^2 N^{-1} m^{-2}	

SECTION A

All questions are compulsory. In case of internal choices, attempt any one of them.

1. Write the underlying principle of a moving coil galvanometer.
2. What is the nature of waves used in RADAR?
3. A closely wound solenoid of 800 turns and area of cross section 2.5×10^{-4} m^2 carries a current of 3A. What is its associated magnetic moment?
4. State Faraday's law of electromagnetic Induction.
5. Which series of hydrogen spectra exists in visible region?
6. How does the maximum kinetic energy of electrons emitted vary with the work function of the metal?

OR

Draw the graph showing the variation of de-Broglie wavelength with square root of accelerating potential for an electron.

7. What happens to the resistance of an intrinsic semiconductor when heated?
8. How does the power of a convex lens vary, if the incident red light is replaced by violet light?
9. Two nuclei have mass numbers in the ratio 1: 8. What is the ratio of their Nuclear radii?
10. Why should a photodiode be operated at a reverse bias?

OR

How does the depletion region of a p-n junction diode get affected under reverse bias?

For question numbers 11, 12, 13 and 14, two statements are given-one labelled Assertion(A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below

a) **Both A and R are true and R is the correct explanation of A**
b) **Both A and R are true but R is not the correct explanation of A**
c) **A is true but R is false**
d) **A is false and R is also false.**

11. **Assertion(A):** A ray of light entering from glass to air suffers change in frequency.
Reason(R): Velocity of light in glass is more than that in air
12. **Assertion(A):**Electron has higher mobility than hole in a semiconductor
Reason(R): Mas**s of** electron is less than mass of hole
13. **Assertion:** Electric lines of force cross each other.
Reason: Electric field at a point superimpose to give one resultant electric field
14. **Assertion**: The tyres of aircrafts are slightly conducting.
Reason: If a conductor is connected to a ground, the extra charge induced on the conductor will flow to ground.

SECTION-B

Questions 15 and 16 are Case Study based questions and are compulsory. Attempt any 4 sub parts from each question. Each question carries 1 mark.

15. Semiconductors

Semiconductors are the basic building block of modern electronics, including transistors, p-n junction diodes, rectifiers, photo diodes, solar cells, LEDs, digital and analog integrated circuits. Semiconductors have crystalline structure and contains very few free electrons at room temperature. Its resistivity lies between that of conductor and insulator. A pure semiconductor is called as intrinsic semiconductor. The semiconductor with suitable impurity atom added to it is called extrinsic semiconductor which is of two types: n-type and p-type semiconductors.

i. A p-type semiconductor is
   a. Positively charged
   b. Negatively charged
   c. Uncharged
   d. Uncharged at 0 K but charged at higher temperatures
ii. When an impurity is doped into an intrinsic semiconductor, the conductivity of the semiconductor
   a. Decreases
   b. Increases
   c. Remains the same
   d. Becomes zero
iii. The conductivity of a semiconductor increases with increase in temperature because
   a. Relaxation time increases
   b. Number density of free charge carriers increases
   c. Both number density of carriers and relaxation time increase

d. Number density of free charge carriers increases, relaxation time decreases but effect of decrease in relaxation time is much less than increase in number density.

iv. The fermi level in n-type semiconductor lies
   a. Half way in the energy gap
   b. Near the valence band in energy gap
   c. Near the conduction band in energy gap
   d. None of these

v. The depletion layer in the p-n junction region is caused by
   a. Drift of holes
   b. Diffusion of charge carriers
   c. Migration of impurity ions
   d. Drift of electrons.

16. Optical fibres: Now-a-days optical fibres are extensively used for transmitting audio and video signals through long distances. Optical fibres too make use of the phenomenon of total internal reflection. Optical fibres are fabricated with high quality composite glass/quartz fibres and its refractive index about 1.7. Each fibre consists of a core and cladding. The refractive index of the material of the core is higher than that of the cladding. An optical fibre is a hair-thin long stand of quality glass or quartz surrounded by a glass coating of slightly lower refractive index. It is used as a guided medium for transmitting an optical signal from one place to another.

i. Optical fibres are used for transmitting audio and video signals through long distances because _____
   (a) it is cheap (b)it is light weight
   (c) it is made by quartz (d) very little loss of energy.

ii. The device which convert one form of energy into another is called _____
   (a) Rectifier (b) Diode
   (c) Oscillator (d) Transducer

iii. The property of light that allows the functionality of an endoscope is ____
   (a) conservation of energy (b) conservation of momentum
   (c) light travel in straight path (d) Total internal reflection

iv. Optical fibres are not useful for _____
   (a) Computer Networking (b) Surgery and dentistry
   (c) Internet (d) Haze Photography

v. The outer concentric shell in fiber optic is called _____
   (a)cladding (b)core
   (c) coat (d) mantle

SECTION-C

All questions are compulsory. In case of internal choices, attempt any one of them.

17. In Young's double slit experiment, the intensity on screen at a point where the Path difference is λ is K, what will be intensity at the point where path difference is λ/4?
18. Draw the circuit diagram of a half wave rectifier and state how it works.
19. For the same value of angle of incidence, the angles of refraction in three media A, B and C are

15°, 25° and 35° respectively. In which medium would the velocity of light be minimum? Justify

20. Write the expression in vector form for the Lorentz magnetic force F due to a charged particle moving with velocity V in a magnetic field B. What is the direction of the magnetic force?
21. A magnet suspended at 30^0 with the magnetic meridian makes an angle of 45^0 with horizontal. What is the actual value of the dip?

OR

Define the terms
(a)Magnetic Declination (b)Magnetic Dip

22. How will the interfernce pattern in Young's Double Slit experiment get affected When
    a. distance between the slits S1 and S2 reduced and
    b. the entire set up is immersed in water?

Justify your answer in each case.

OR

The fringe width in a Young's Double Slit Interference pattern is 2.4×10^{-4}m when red light of wavelength 6400Å is used. By how much will it change, if blue light of wavelength 4000Å is used?

23. An electric dipole is held in a uniform electric field.
(i) Show that the net force acting on it is zero.
(ii) The dipole is aligned parallel to the field. Find the work in rotating it through the angle of 180^0.

24. Explain with the help of a circuit diagram, the working of a p-n junction diode as a half wave rectifier

25. Define Self Inductance. If the rate of change of current of 2A/s induces an emf of 10mV in a solenoid. What is the self-inductance of the solenoid?

SECTION-D

All questions are compulsory. In case of internal choices, attempt any one of them.

26. Using Bohr's theory of hydrogen atom, derive the expression for the total energy of the electron in the stationary states of the atom.
Calculate the wavelength of the first spectral line in the corresponding Lyman series of this atom.

OR

i. Explain briefly how Rutherford scattering of α-particle by a target nucleus can provide information on the size of the nucleus.
ii. Show that density of nucleus is independent of its mass number A.

27. Draw the 'Energy bands', diagrams for a
    i. pure semiconductor
    ii. insulator.

How does the energy band for a pure semiconductor get affected when it is doped with

(i) an acceptor impurity
(ii) donor impurity?

OR

With the help of circuit diagrams, distinguish between forward biasing and reverse biasing of a p-n junction diode. Draw V-I characteristics of a p-n junction diode in forward bias and reverse bias

28. A rod of length l is moved horizontally with a uniform velocity 'v' in a direction perpendicular to its length through a region in which a uniform magnetic field is acting vertically downward.
(a) Derive the expression for the emf induced across ends of the rod.
(b) How does one understand this motional emf by invoking the Lorentz force acting on the free charge carriers of the conductor? Explain.

29. The work function of caesium metal is 2.14 eV. When the light of frequency 6×10^{14} Hz is incident on the metal surface, photoemission of electrons occurs. Calculate:
(a) the maximum kinetic energy of the emitted electrons
(b) stopping potential,
(c) the maximum speed of the emitted photoelectrons?

30
i. In a potentiometer arrangement, a cell of emf 1.25 V gives a balance point at 35 cm length of the wire. If the cell is replaced by another cell, the balance point shifts to 63 cm. What is the emf of the second cell?
ii. Why thick copper wires are used in a slide wire bridge?

SECTION E

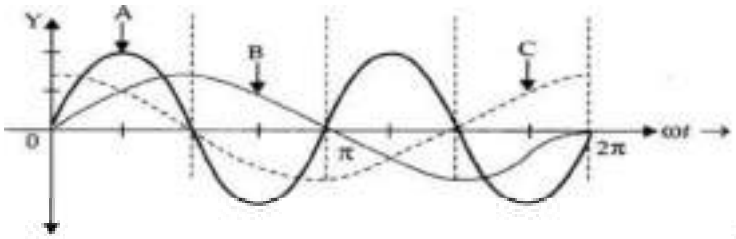
All questions are compulsory. In case of internal choices, attempt any one of them

31.
i. Derive an expression for the electric field at any point on the axial line of an electric dipole.
ii. Two identical point charges, q each are kept 2m apart in air. A third point charge Q of unknown magnitude and sign is placed on the line joining the charges such that the system remains in equilibrium. Find the position and nature of Q.

32.
a) Draw a labelled diagram of an ac generator.
b) Obtain the expression for the emf induced in the rotating coil of N turns each of cross-sectional area A, in the presence of a magnetic field B
c) A horizontal conducting rod 10 m long extending from east to west is falling with a speed 5.0 ms^{-1} at right angles to the horizontal component of the Earth's magnetic field, 0.3×10^{-4} Wb m^{-2}. Find the instantaneous value of the emf induced in the rod.

OR

A device 'X' is connected to an ac source $V = V_0 \sin \omega t$. The variation of voltage, current and power in one cycle is shown in the following graph:
(a) Identify the device 'X'.
(b) Which of the curves A, B and C represent the voltage, current and the power consumed in the circuit? Justify your answer.



(c) How does it impedance vary with frequency of the ac source? Show graphically. Obtain an expression for the current in the circuit and its phase relation with ac voltage.

33. State Huygens's principle. Show, with the help of a, suitable diagram, how this principle is used to obtain the diffraction pattern by a single slit.
Draw a plot of intensity distribution and explain clearly why the secondary maxima become weaker with increasing order (n) of the secondary maxima.

OR

(a) In young's double slit experiment, describe briefly how bright and dark fringes are obtained on the screen kept in front of a double slit. Hence obtain the expression for the fringe width.
(b) The ratio of the intensity at minima to the maxima in young's double slit experiment is 9:25. Find the ratio of the widths of the two slits.

MARKING SCHEME

KOCHI METRO SAHODAYA

By All & For All

AISSCE MODEL EXAMINATION 2020 - 2021

ACCOUNTANCY

ANSWER KEY

1. d
2. b
3. d
4. d
5. c
6. c
7. a
8. 7% on 5,00,000.
9. b
10. b
11. 3600
12. c
13. c
14. 1,00,000 +28,000 +20,000=1,48,000

OR

80,000+4,70,000 -60,000=4,70,000 (3)

15. Amit's capital a/c Dr 5152
Vineet,s capital a/c Dr 6272
To Sumit's capital a/c 11,424

OR

Loss transferred to A - 1,00,000 , B - 1,00,000 , C - 1,00,000
Partners' capital a/c balance A - 8,00,000, B - 6,00,000, C - 7,00,000 (4)

16. Share Capital a/c Dr 5,000
To Share forfeiture a/c 2,000
ToCalls in arrears a/c 3,000
Bank a/c Dr 2,400
Share forfeiture a/c Dr 600
To share capital a/c 3,000
Share forfeiture a/c Dr 600
To capital reserve a/c 600 (4)

17. (a) No entry
(b) Realisation a/c Dr 1,900
To Y's capital a/c 1,900
(c) Realisation a/c Dr 20,000
To Z's capital a/c 20,000
(d) (i) Realisation a/c Dr 5,000
To bank a/c 5,000
(ii) Bank a/c Dr 2500
To realisation a/c 2,500 (4)

18. In the absence of Partnership Deed
(a) No interest will be paid on extra capital introduced
(b) Deep cannot be admitted as Bose and Chatterjee don't agree'
(c) No interest will be charged from Chatterjee as rate of interest was not agreed.
(d) Interest on drawings will not be charged from Sarkar. (4)

19. Surplus - 1,50,000
Capital Fund - 1,23,50,000
B/S total - 1,30,00,000 (6)

20.(a) P & M A/C Dr 2,00,000
To Vendor's A/C 2,00,000

Vendors A/C Dr 2,00,000
Discount on issue of debentures A/C 15,000
To Bank a/c 65,000
To 6% Debentures A/C 1,50,000

Securities Premium Reserve A/C Dr 10,000
Statment of P & L A/C Dr 5,000
To Discount on issue of Debentures A/C 15,000

(b) Bank A/C Dr 2,00,000
To Debenture Application A/C 2,00,000

Debenture Application A/C Dr 2,00,000
To 9% Debentures A/C 2,00,000

Debenture Allotment A/C Dr 3,00,000
Loss on issue of debentures A/c Dr 40,000
To 9% Debentures A/C 3,00,000
To Premium on redemption of debentures A/C 40,0000

Bank A/C Dr 3,00,000
To Debenture Allotment A/c 3,00,000 (6)

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21. Revaluation A/C Dr 6,500
To Provision for doubtfuldebt 1,500
To Workmen Compensation A/C 5,000

Land & Building A/C Dr 3,000
Stock A/C Dr 2,500
To Revaluation A/C 5,500

Subash's capital A/C Dr 600
Asha's capital A/C Dr 400
To Revaluation A/C 1,000

General Reserve A/c Dr 30,000
To Subash's capital A/C 18,000
To Asha's capital A/ C 12,000

Bank A / C Dr 25,000
To Capital A/C 15,000
To Premium A/C 10,000

Premium A/ C Dr 10,000
To Subash's capital A/C 6,000
To Asha's capital A/C 4,000

Subash's capital A/C	Dr 3,000		
Asha's capital A/C	Dr 2,000		
To Adverisement Suspense a/c		5,000	(8)

OR

Gain on Revaluation - 18,000,

Capital A/C balances Pankaj - 47,000, Saurab - 25,000, Total amount at credit in Naresh's cpl 54,000. Payment to Naresh 28,000, Bank Loan - 20,400, Balance Sheet - 1,564,800.

22. Bank A/c Dr 1,84,000
To Share application a/c 1,84,000

Share application a/c	Dr 1,84,000		
To Share capital a/c		1,20,000	
To Bank a/c		4,000	
To share allotment a/c		60,000	

Share allotment a/c	Dr 1,80,000		
To Share capital a/c		1,80,000	
Bank a/c	Dr 1,08,000		
To Share allotment A/C		1,08,000	
Share first and final call a/c	Dr 3,00,000		
To share capital a/c		3,00,000	
Bank a/c	Dr 2,50,000		
To share first and final call		2,50,000	
Share capital a/c	Dr 40,000		
To share allotment a/c		12,000	
To share first& final call		20,000	
To share forfeiture a/c		8,000	

Allotment money due	1,80,000	
Less already received	60,000	
	1,20,000	
Less actual amount received	1,08,000	
	12,000	

Number of shares from whom allotment money has not been received =12,000/3= 4,000 shares.

OR

Bank a/c	Dr 1,52,000		
To share application a/c		1,52,000	
Share application a/c	Dr 1,52,000		
To share capital a/c		1,00,000	
To share allotment a/c		40,000	
To bank a/c		12,000	
Share allotment a/c	Dr 3,00,000		
To share capital a/c		1,50,000	
To securities premium reserve a/c		1,50,000	
Bank a/c	Dr 2,57,660		
To share allotment a/c		2,57,660	

Share first call a/c	Dr	1,50,000		
To share capital a/c			1,50,000	
Bank a/c	Dr	1,48,650		
To share first call a/c			1,48,650	
Share capital a/c	Dr	3,600		
Securities premium reserve a/c	Dr	1350		
To share allotment			2,340	
To share first call			1,350	
To share forfeiture a/c			1,260	
Bank a/c	Dr	4,050		
Sharew forfeiture a/c	Dr	450		
To share capital a/c			4,500	
Share forfeiture a/c	Dr	810		
To capital reserve a/c		810		
Share final call a/c	Dr	99.100		
To share capital a/c			99,100	
Bank a/c	Dr	99,100		
To share final call a/c			99,100	(8)

23. c
24 b
25, Trade receivable turnover ratio
26. d
27. other current asset
28. c
29. a
30. 4. 64 times
OR
Quick assets 2,40,000
Current assets4,00,000 (3)

31. COMPARATIVE STATEMENT OF PROFIT AND LOSS (4)

Particulars	Note No.	31-3-18	31-3-2019	absolute change	percentage
1. Revenue from operations		20,00,000	30,00,000	10,00,000	50
2. Other income		5,00,000	6,00,000	1,00,000	20
3. Total Revenue		25,00,000	36,00,000	11,00,000	44
4. Expenses		8,00,000	15,00,000	7,00,000	87.5
5. Profit before tax		17,00,000	21,00,000	4,00,000	23.5
6. Tax		6,80,000	8,40,000	1,60,000	23.5
7. Profit after tax		10,20,000	12,60,000	2,40,000	23.5

OR

COMMON SIZE BALANCE SHEET AS AT 31 - 3 - 2020

Particulars	Note no.	31-3-2019	31-3-2020	31-3-2019	31-3-2020
IEQUITY & LIABILITIES					
1, Shareholders fund					
Share capital		18,00,000	32,00,000	37.5	50
Reser ves & surplus		6,00,000	8,00,000	12.5	12.5
2. Non- current liabilities					
Long term borrowings		12,00,000	16,00,000	25	25
3. Current liabilities		12,00,000	8,00,000	25	12.5
		48,00,000	64,00,000	100	100

II ASSETS				
1.Non- current assets				
Fixed assets	16,00,000	18,00,000	33,3	28.1
Non-current investment	6,00,000	8,00,000	12.5	12.5
2. Current Assets				
Inventories	8,00,000	10,00,000	16.7	15.7
Trade receivables	12,00,000	16,00,000	25	25
Cash& cash equivalents	6,00,000	12,00,000	12.5	18.7
	48,00,000	64,00,000	100	100

32. Cash flow from operating activities 1,17,000
Cash flow from investing activities (92,000)
Cash flow from financing activities 30,000. (6)

MARKING SCHEME

1. c) Rs.18,00,000
2. c) Realisation Account
3. d) 7.5 months
4. d) Entrance fees
5. d) Credited to Bank Account
6. (c) by debiting all partners' capital accounts in their old profit sharing ratio.
7. d) Gold's Capital A/c Dr. 10,000
   To Diamond's Capital A/c 10,000
8. c) Rs.97,500
9. b) Rs.5,000 each
10. a) 19 : 11 : 20
11. Premium
12. Authorised/ Nominal/ Registered
13. Yes. Because death of a partner will result in change in partnership agreement. (1/2 mark for answer and ½ mark for reason)
14. Calculation of Amount of Sports Material Consumed = Opening Stock of Sports Material + Purchases (Cash +Credit) - Closing Stock of Sports Material
    = Rs.30,000+ (Rs.1,38,000 + Rs.23,250) - Rs.5,000… (1/2 mark each=1/2 x 4= 2 marks)
    = Rs.1,86,250… ..1 mark

OR

Subscription Account

Date	Particulars	JF	Amount	Date	Particulars	JF	Amount
	Balance b/d (outstanding)		50,000		Balance b/d (advance)		25,000
	Income and Expenditure Account (Bal.)		2,30,000		Receipts and Payments A/c		2,50,000
	Balance c/d (advance)		30,000		Balance c/d (outstanding)		35,000
			3,10,000				3,10,000

15. Balance Sheet of Tanmay Ltd. As at

Particulars	Note no	Amount (Rs.) Current year	Amount (Rs.) Previous year
EQUITY & LIABILITIES Shareholder's funds : a) Share Capital	1	5,79,600	……

NOTES TO ACCOUNTS

Particulars	Amount
1. Share Capital Authorised Capital : 2,00,000 equity shares ofRs.10 each	20,00,000

Issued Capital 1,00,000 equity shares ofRs.10 each	10,00,000
Subscribed Capital	5,78,400
Subscribed but not fully paid 96,400 shares ofRs.10 each,Rs.6 called-up	1,200 5,79,600
Add : Forfeited shares A/c	

16. Sacrificing share = Old share – New share

Anita= 1/6 (sac)

Asha=-1/6 (gain)

Amrit= 0

Average profits = (1,20,000+3,00,000+3,40,000+3,80,000 – 1,40,000) / 5

= Rs.2,00,000

Goodwill = 2,00,000 X 3 =Rs.6,00,000

Anita will receive = 6,00,000 X 1/6 = 1,00,000

Asha will pay = 6,00,000 X 1/6 = 1,00,000

JOURNAL

Date	Particulars	LF	Amount	Amount
1.4.20	Asha's Capital A/c Dr. To Anita's Capital A/c (Being the adjustment for goodwill made on change in profit sharing ratio)		1,00,000	 1,00,000

OR

Date	Particulars	LF	Amount	Amount
	Sam's Capital A/c Dr. Siya's Capital A/c Dr. Riya's Capital A/c Dr. To Profit and Loss A/c (Undistributed loss transferred to Partners' Capital Accounts)		25,000 15,000 10,000	 50,000
	Investment Fluctuation Fund A/c Dr. To Investments A/c To Sam's Capital A/c To Siya's Capital A/c To Riya's Capital A/c (Investments Fluctuation Fund distributed to Partners' Capital Accounts after meeting the decrease in the value of investments)		40,000	 20,000 10,000 6,000 4,000
	Siya's Capital A/c Dr. Riya's Capital A/c Dr. To Sam's Capital A/c (Adjustment entry made for goodwill)		60,000 30,000	 90,000

17. Profit and Loss Appropriation Account (For the year ended 31.3.2020)

Particulars		Amount	Particulars	Amount
Shiv's capital (share of profit) Less: Share in deficiency	1,60,000 13,334	 1,46,666	By Profit and loss (Net profit)	 3,20,000

Ram's capital (share of profit) 80,000 Less: Share in deficiency 6,666 Vishnu's capital (share of profit) 80,000 Add: Deficiency received from: Shiv 13,334 Ram 6,666	73,334 1,00,000		
	3,20,000		3,20,000

18. Average profits = 92000+150000+244000 / 3 =Rs.1,62,000
Nine month's profit (from 1-4-2019 to 31.12.2019) = 1,62,000 × 9/12
= Rs.1,21,500
Share of Q till his death = 1,21,500 × ⅓ =Rs.40,500

JOURNAL

Date	Particulars	LF	Amount	Amount
31.3.20	Profit and loss Suspense A/c Dr. To Q's Capital A/c (Q's share of profit till the date of his death)		40,500	 40,500

19. Share surrendered by Krishna to Radha = 1/5 × 1/5 = 1/25
Share surrendered by Krishna to Balram= 4/5 × 1/5 = 4/25
Radha's New share = 14/25 + 1/25 = 15/25
Balram's new share = 6/25 + 4/25 = 10/25
Gaining Ratio = 1 : 4
New Ratio = 15 : 10 or 3 : 2

Average profits = (50,000 + 55,000+ 60,000)/ 3 =Rs.55,000
Super Profits = 55,000 – 30,000 = Rs.25,000
Goodwill = Rs.25,000 × 2 =Rs.50,000
Krishna's share of Goodwill = 50,000× 1/5 = 10,000

JOURNAL

Date	Particulars	LF	Amount	Amount
	Radha's Capital A/c Dr. Krishna's Capital A/c Dr. Balram's Capital A/c Dr. To Goodwill A/c (Being the existing goodwill written off)		42,000 15,000 18,000	 75,000
	Radha's Capital A/c Dr. Balram's Capital A/c Dr. To Krishna's Capital A/c (Being Krishna's share of goodwill adjusted in the capital accounts of gaining partners in gaining ratio 1:4)		2,000 8,000	 10,000

	Profit & Loss Appropriation A/c Dr. To Radha's Capital A/c To Balram's Capital A/c (Being the profits distributed in new ratio)		1,00,000	 60,000 40,000

20. Realisation account

Particulars		Amount	Particulars		Amount
To Debtors		76,000	By Creditors		36,000
To Stock		2,00,000	By O/s expenses		10,000
To Furniture		20,000	By Gopal's wife's loan		50,000
To Leasehold premises		1,00,000	**By Bank A/c**		
To Gopal's capital A/c			Leasehold premises	1,50,000	
Gopal's wife's loan	50,000		Debtors	64,000	
Realisation expenses	10,000	60,000	Stock	1,84,000	3,98,000
To Bank A/c					
Creditors	16,200				
Outstanding expenses	10,000	26,200			
To profit transferred to:					
Harish's Capital A/c	7,080				
Gopal's capital A/c	4,720	11,800			
		4,94,000			4,94,000

OR

JOURNAL

Date	Particulars	LF	Amount	Amount
	Bank/ Cash A/c Dr. To Realisation A/c (Bad debts earlier written off, now recovered)		88,000	 88,000
	Realisation A/c Dr. To Bank A/c (Payment made to creditors)		50,000	 50,000
	Rani's loan A/c Dr. To Bank/ Cash A/c To Realisation A/c (Raja's loan settled)		18,000	 17,000 1,000
	Raja's Capital A/c Dr. Cash/ Bank A/c Dr. To Realisation A/c (Investments taken over by Raja and remaining sold)		52,000 12,000	 64,000
	Realisation A/c Dr. To Cash/ Bank A/c (Dissolution expenses paid by the firm)		19,000	 19,000
	Realisation A/c Dr. To Raja's Capital A/c To Rani's Capital A/c To Rita's Capital A/c		30,000	 12,000 12,000 6,000

	(Profit on dissolution credited to partners' capital accounts)			

21. Books of Himadri Limited Journal

Date	Particulars	LF	Amount	Amount
	Bank A/c Dr. To Equity Share Application A/c (Application money on 10,000 shares @Rs.20 per share received)		2,00,000	 2,00,000
	Share Application A/c Dr. To Equity Share Capital A/c (Application money transferred to share capital)		2,00,000	 2,00,000
	Share Allotment A/c Dr. To Equity Share Capital A/c (Money due on allotment of 10,000 shares @Rs. 30 per share)		3,00,000	 3,00,000
	Bank A/c Dr. To Equity Share Allotment A/c (Allotment Money received on 10,000 shares @ Rs. 30 per share on)		3,00,000	 3,00,000
	Share First Call A/c Dr. To Equity Share Capital A/c (Money due on 10,000 shares @ Rs. 20 per share on Ist Call)		2,00,000	 2,00,000
	Bank A/c Dr. To Equity Share First Call A/c (First call money received except for 300 shares)		1,94,000	 1,94,000
	Share Second and Final Call A/c Dr. To Equity Share Capital A/c (Money due on 10,000 shares @ Rs. 30 per share on Second and Final Call)		3,00,000	 3,00,000
	Bank A/c Dr. To Equity Share Second and Final Call A/c (Second and Final Call money received except for 300 shares)		2,91,000	 2,91,000
	Share Capital A/c Dr. To Equity Share First Call A/c To Equity Share Second and Final Call A/c To Share Forfeiture A/c (300 shares forfeited)		30,000	 6,000 9,000 15,000

OR

Books of the Jain Ltd. Journal

Dates	Particulars	LF	Amount	Amount
	Bank A/c Dr. To Equity Share Application A/c		1,00,000	 1,00,000

	[Application money received on 1,00,000 shares]			
	Share Application A/c Dr. To Equity Share Capital A/c (Application money transferred to share capital)		1,00,000	 1,00,000
	Equity Share Allotment A/c Dr. To Equity Share Capital A/c [Allotment money due on 1,00,000shares]		2,00,000	 2,00,000
	Bank A/ c Dr. To Share Allotment A/c [Allotment money received except on 1,000 shares]		1,98,000	 1,98,000
	Equity Share Capital Dr. To Forfeited Shares A/c To Equity Share Allotment A/c [Forfeiture of 1,000 shares for non-payment of allotment money]		3,000	 1,000 2,000
	Equity Share First Call A/c Dr. To Equity Share Capital A/c [First call money due on 99,000 shares]		2,97,000	 2,97,000
	Bank A/c Dr. To Equity Share First Call A/c [First Call money received except on 500 shares]		2,95,500	 2,95,500
	Equity Share Capital A/c Dr. To Forfeited Shares A/c To Equity Share first call A/c [Forfeiture of 500 shares for non-payment of first call money]		3,000	 1,500 1,500

22. Revaluation a/c

Particulars		Amount	Particulars	Amount
Machinery		2,000	Building	5,000
Provision for bad debts		480		
Transfer of profit on revaluation to:				
A's Capital	1,680			
B's Capital	840	2,520		
		5,000		5,000

Partners' Capital Account

Particulars	A	B	C	Particulars	A	B	C
To Balance c/d	63,680	38,840	30,000	Balance b/d	50,000	32,000	
				By Bank			30,000
				By Prem.for G/W	8,000	4,000	
				By Gen.Res.	4,000	2,000	
				By Reval	1,680	840	
	68,680	38,840	30,000		68,680	38,840	30,000

Balance Sheet as on 31.3.2020

Liabilities		Amount	Asset	Amount
Creditors		8,000	Cash	2,000
Bills payable		4,000	Bank	52,000
Provision for D.debts		480	Debtors	8,000
Capitals :			Stock	10,000
A	63,680		Furniture	5,000
B	38,840		Machinery	23,000
C	30,000	1,32,520	Building	45,000
		1,45,000		1,45,000

OR

Revaluation A/c

Particulars	Amount	Particulars	Amount
To Profit transferred to:		By Stock	16,000
Gaurav's Capital A/c 36,000		By Building	1,00,000
Rakesh's Capital A/c 60,000		By Investments	4,000
Garvita's Capital A/c 24,000	1,20,000		
	1,20,000		1,20,000

Partners' Capital Account

Particulars	Gaurav	Rakesh	Garvita	Particulars	Gaurav	Rakesh	Garvita
To Rakesh's Capital A/c	90,000		60,000	By Balance b/d	3,00,000	2,00,000	1,00,000
To Rakesh'a Loan A/c		4,80,000		By Gen.Res.	12,000	20,000	8,000
To balance c/d	2,58,000		72,000	By Reval.	36,000	60,000	24,000
				By Gaurav's Capital A/c		90,000	
				By Garvita's Capital A/c		60,000	
	3,48,000	4,30,000	1,32,000		3,80,000	4,30,000	1,32,000

Balance Sheet as on 31.3.2020

Liabilities		Amount	Assets	Amount
Creditors		60,000	Cash (50000+34000)	84,000
Rakesh's Loan A/c		4,30,000	Debtors	40,000
Capitals :			Stock	96,000
Gaurav	2,58,000		Building	6,00,000
Garvita	72,000	3,30,000		
		8,20,000		8,20,000

23. Securities Analysis
24. Proceed from sale of scrap
25. nil
26. 1,80,000
27. Financing activity
28. Time series
29. True
30. i) Noncurrent liability, other current liability
    ii) Current asset, cash and cash equivalents

iii) Shareholders fund, reserves and surplus

OR

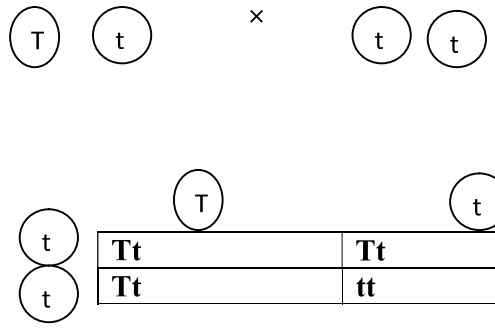
Do it

31. Do it
32. Cash flow from Operating activity=2,52,500
    Cash used in Investing activity=3,12,500
    Cash flow from Financing activity=85,000
    Net increased in Cash and cash equivalents= 25000

KOCHI METRO SAHODAYA
AISSCE MODEL EXAMINATION CLASS - XII (2020-2021)
MARKING SCHEME
BIOLOGY (044)

Sl.NO	Answer	Marks
1	Cleistogamous flowers	1
2	Blastocyst	1
3	Round/wrinkled Yellow /Green	½ ½
4	A segment of DNA Coding for a polypeptide	½ ½
5	Reverse transcription of viral RNA on to viral DNA, then incorporates with the host DNA.	1
6	Body will have memory of the first encounter/presence of antibodies developed during primary immune response.	1
7	Mucosal Associated Lymphoid Tissue Macrophages	½ ½
8	1. LAB improves nutrient quality of card by increasing the content of Vitamin B_{12} 2. They also check the decrease causing microbes in our stomach.	½ ½
9	Secondary treatment is a biological process as it employs the heterotrophic microbes naturally present in the sewage.	1
10	When it infects a plant cell, it delivers a part of its DNA, called T-DNA for tumor inducing (Ti) into the plant cell and transform it into a tumor cell	1
11	A	
12	C	
13	A	
14	D	
15	i. a ii. c iii. c iv. d v. c	
16	i. d ii. b iii. a iv. c v. a	
17	Section B Polyembryony:- Nucellar cells surrounding the embryo sac start dividing, protrude into the embryo sac and develop into the embryos. In such species ovule contain many embryos, occurrence more than one embryo in seeds in formed as polyembryony.	1 ½ ½
18	Fallopian tube ZIFT (Zygote Intra Fallopian Transfer)	½ ½
19	ABO blood group in human population is an example of multiple allelism Three alleles for the gene I. I^A, I^B, i When I^A and I^B present together blood group is AB Both A and B are expressed and is called co-dominance.	½ ½ ½ ½

20	**Drosophila melanogaster** **Grown in simple synthetic medium, complete life cycle in two weeks / short life cycle, single mating produce more progeny, sexual dimorphism, many heritable variations / easy to handle. (any3)** **OR** **In Drosophila , yellow bodied, white eyed female was crossed with brown bodied red eyed male ,F_1 progency produced and intercrossed with F_2 and ratio deviated from 9:3:3:1. The genes for eye colour and body colour are closely located on X chromosome ,showing linkage & therefore inherited together, recombinants were formed due to crossing over but at low percentage**	½ 1½ ½ ½ ½ ½
21	**a. small intestine** **b. Rhino virus** **c. Nose / respiratory passage** **d. Alveoli of lungs**	**½ x4**
22	**a. Human erythrocytes (RBCs)** **b. In the intestine of mosquito**	**1** **1**
23	**To take up the hydrophilic DNA from the external medium** **Divalent calcium ions increase the efficiency of DNA ,entering the cell through pores in the cell wall.**	**1** **1**
24	**Small animals have a larger surface area relative to their volume.** **and they tend to lose body heat fast when it is cold outside.** **They have to expend much energy to generate body heat through metabolism.**	**1** ½ ½
25	**When alien species are introduced, they turn out to be invasive and are responsible for decline or extinction of indigenous species. Three examples are-** **(i) Cichlid fish which is found in Lake Victoria led to extinction of nearly 200 species which introduced Nile Perch into Lake Victoria.** **(ii) The inclusion of invasive species such as carrot grass (Parthenium), Lantana and water hyacinth (Eichhornia) led to environmental damage of the native species.** **(iii) The indigenous catfishes found in rivers are a major species of extinction by the introduction of African catfish Clarias gariepinus which is a major advantage for aquaculture purposes.**	**1** ½ ½
26	**SECTION – C** • **Progesterone / Progesterone - estrogen combination** • **Inhibition of ovulation** • **Inhibition of motility & secretary activity of fallopian tube** • **Changes in the endometrium** • **Make uterus unsuitable for implantation** • **Saheli** **OR** **a. Uncontrolled population growth/social evil like see abuse/sex related crime STDs (any two)** **b. Fetal sex determination tests based on chromosomal pattern in the amniotic fluid to study chromosomal abnormalities in the foetus.** **c. Banned to legally check female feticide.**	½ ½ ½ ½ ½ ½ ½×2 1 1
27	**Test cross is made between F1 and a recessive phenotype.** **Eg: Tall Dwarf**	**1**

	Tt × tt  T t t | Tt | Tt t | Tt | tt **50% Tall ; 50% Dwarf** **Geographic & phenotypic ratio is 1:1**	½ ½
28	**RNA is the first genetic material because** **1. RNA can directly code for the synthesis of proteins hence can easily express the character. It's the genetic material in many viruses.** **2. RNA can also act as catalyst** **3. Many essential life processes like splicing transaction etc. have evolve around RNA.**	**1** **1** **1**
29	**a. i. Morphine** **ii. Lysergic acid diethylamides (LSD) or Barbiturates** **b. Moderate doses of cocaine have a stimulating action on central nervous system and produce a sense of euphoria and energy. High dosage of cocaine causes hallucination.**	**1** **1** **1**
30	**a. Leguminous plants have Rhizobium – It fixes atmospheric N_2 and enriches soil.** **b. Cyanobacteria – fixing N_2 in soil as nitrogen compounds, adding organic matter through photosynthesis.** **c. Mycorrhiza absorb phosphorous and provide resistance to root borne pathogens, resistance to salinity & draught.** **OR** **Baculoviruses belong to genes Nucleo polyhedrovirus. They are pathogen which attack insects and arthropods. Species specific narrow spectrum insecticides, no negative impact on plants, birds, mammals.** **Beneficial insects are conserved to aid IPM programmes.**	**1** **1** **1** **1** **1** **1**
31	**SECTION D** **a. Corpus Luteum** • **Secretes progesterone** • **Prepares endometrium for implantation & maintains pregnancy** **b. Endometrium** • **Highly vascular** • **Undergoes cyclic changes and prepares implantation and placentation.** **c. Acrosome** • **Secretes sperm lysins** • **Dissolves Zona Pellucida** **d. Sperm tail** • **Shows lashing movements** • **Provide forward push to sperm** **e. Fimbriae : Finger like process in fallopian tube increase the chance of trapping ovum released from the ovary.** **OR** **a. Refer NCERT Text Page 50**	½ ½ ½ ½ ½ ½ ½ ½ ½ **1**

	b. Estrogen and progesterone are the ovarian hormones. **c. i. Endometrium regenerates by proliferation under the influence of estrogen.** **ii. Endometrium is maintained for the implantation under the influence of progesterone.** **iii. Corpus luteum degenerates, endometrium disintegrates leading to menstruation. (1/2 x4)**	
32	**Parents** **Round Yellow** **RRYY** **Wrinkled Green** **rryy** RY ry **F1 generations:** **RrYy - Round Yellow** **Selfing** RY Ry rY ry × RY Ry rY ry  9:3:3:1 **Law of Independent Assortment:-** **It states that when two pairs of traits are combined in a hybrid, segregation of one pair of character is independent of the other pair of characters.** **OR** **Virus / phage labeled with S-35/P32 separately infected q,coti/infection proceeds/ for few generation, viral coats removed by agitating/blending, viral particles separated from bacteria by configuration/ spinning, radioactive S-35 of viral coat was detected in the supernatant , as coat did not enter the cell, radio P-32 was detected in the bacterial cell.** **Conclusion: DNA passes from virus to bacteria not the protein, DNA is the genetic material .** **OR** **Diagram showing infection, blending and centrifugation.**	½ ½ ½ ½ 1 ½ ½ 1 ½×8 ½×½
33	**Using the technique of RNA interference transgenic tobacco plant is protected against Meloidogyne incognita, using Agrobacterium as vectors, nematode specific genes were introduced into the host plant produces both sense and anti sense RNA, these 2 RNAs form ds RNA, silences specific mRNA of nematode, no protein synthesis / translate, hence nematode cannot survive in tobacco plant.** **OR** **a. Thermus aquaticus** **It is a thermostable DNA polymerase, does not get destructed and remain active during PCR .**	**½×10** **1** **½×½**

	b. Adenosine deaminase, it is essential for immune system to function. Its deficiency can be cured by gene therapy. Lymphocytes from patients are extracted and cultured, functional ADA cDNA is introduced into lymphocytes using a vector and returned into the patient.	**½×6**

BIOLOGY(2020-2021)
Answer Key

Grade: XII **Marks: 70**

SECTION A

1. Number of chromosome in endosperm is 24 (3n) **……..½ mark**
   Number of chromosome in antipodal cell is 8 (n) **……..½ mark**

2. Natural contraceptive method **…….½ mark**
   No side effects. **……..½ mark**

3. The two activities of animals which get cues from diurnal and seasonal variations in light intensity are:
(i) Timing their foraging
(ii) Migratory activities
(iii) Reproduction **……. any two**
½ mark for each point

4. Male honey bees are formed from unfertilized egg **……..½ mark**
   Female develops through fertilization **……..½mark**

5. 5−G↓AATTC3
   3−CTTAA↑G5 **……1 mark**

6. Biopiracy is the practice of commercially exploiting naturally occurring biochemical or genetic material, especially by obtaining patents that restrict its future use, while failing to pay fair compensation to the community from which it originates **……1 mark**

7. Virus infected cells secrete proteins called interferons. **……..½ mark**
Interferons protect non infected cells from further viral infections. **……..½ mark**

8. – Commensalism **……½ mark**
– As egrets move, the cattle stir up and flush out from the vegetation the insects which otherwise might be difficult for the egrets to find and catch. Thus, the egrets are benefited while the cattle are neither benefited nor harmed. **……½ mark**

9. Cry genes are present in Bacillus thuringiensis **……½ mark**

In which each gene encodes a protein with strong specific activity against only one or a few insect species. **……½ mark**

10. Latitudinal biodiversity with explanation **……1 mark**

11. A

OR **……1 mark**

C

12. C. **……1 mark**

13. A **……1 mark**

14. D **……1 mark**

15. i) D

` ii) C

iii) A

iv) C

v) B

Any four- each carries 1 mark

16.i) B

ii) B

iii) C

iv) C

v) C

Any four- each carries 1 mark

SECTION B

17. PCR….Very low concentration of bacteria or virus can be detected by amplification of their nucleic acid

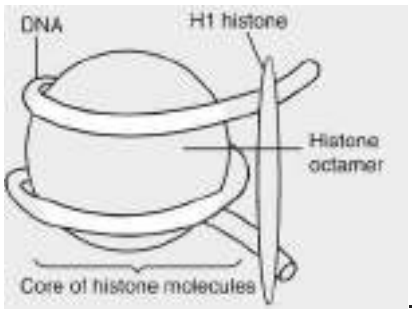
ELISA….Immunochemical clinical test used to detect antibodies and antigen in a same antigen-antibody interactions. **……. 1 mark for each point**

18. The physiological condition or responses in order to get acclimatised to high altitudes are:
(i) To compensate low oxygen, the production of red blood cells is increased.
(ii) High haemoglobin content and its decreased binding capacity.
(iii) Faster breathing rate **any two…….1 mark each**

19. Restriction enzymes cut the DNA sequence a little away from the centre of the palindrome site but between the same two bases on the opposite strands, leaving single stranded portions at the ends these over hanging stretches portions at the ends these over hanging stretches are called sticky ends on each strand. **…….1 mark**

The form hydrogen bonds with the complementary cut counterparts, facilitates the action of ligase enzymes to join the foreign and the vector DNA strands. **…….1 mark**

20.



. **…….1 ½ mark**

Location: Chromatin of nucleus. . **……½ mark**

OR

Presence of adhesive organs or suckers

Loss of digestive system

Loss of unnecessary sense organs

High reproductive efficiency . **½ mark for each point**

21 Dichogamy: Sometimes the stamens and stigma of a bisexual flower mature at different time to prevent autogamy.

ii Self incompatibility being genetic mechanism prevents self-pollination. **……1 mark each**

22. A – Trophoblast **……½ mark**

Function – gets attached to the endometrium and draws nutritive material secreted by uterine endometrium **……½ mark**

B – Inner cell mass **……½ mark**

Function – Differentiate ad embryo **……½ mark**

OR

Sacred groves are highly protected due to religious and cultural traditions ,refuges for large number of rare and threatened plants. **……..1 mark**

Ecologically unique and biodiversity rich region **……..1 mark**

23. a. Female **……½ mark**

b. Male **……½ mark**

c. Female **……½ mark**

d. Male **……½ mark**

24. More tolerant to abiotic stresses. **…….½ mark**

Reduced reliance on chemical pesticides. **……½.mark**

Enhanced nutritional value of food **……½.mark**

Increased mineral usage by plants **…….½mark**

25. a) A – Antigen binding site **…….½mark**

B – Light chain **……½.mark**

C – Heavy chain **…….½mark**

b) B lymphocyte **……½.mark**

SECTION C

26. (i) When Meloidogyne incognita (parasite) consumes cells with RNAi gene, parasite cannot survive and this prevents infection. The introduced DNA forms both sense and anti-sense RNA. These two strands being complementary to each other form of sRNA, leading to RNAi. Thus, the mRNA of nematode is silenced and the parasite cannot survive there. This produces Meloidogyne incognita resistant tobacco plants. **…….2 mark**

(ii) Due to the RNAi process, specific mRNA of nematode is silenced. The result is that the parasite could not survive on eating such GM or transgenic plant (host), expressing, specific interfering RNA

…….1 mark

27.(i) A depicts conformers. **…… .½ mark**

(ii) The other line B depicts regulators. **……. ½ mark**

(iii) Differences between conformer and regulator are:

Conformer	Regulator
These cannot maintain a constant internal environment and change according to the ambient atmospheric conditions.	These organisms maintain a constant internal environment despite changes in the environment.
They show a narrow range of distribution.	They show a much wider range of distribution.

…….. 1 mark

(iv) . Humans are regulators **…….. 1 mark**

28.

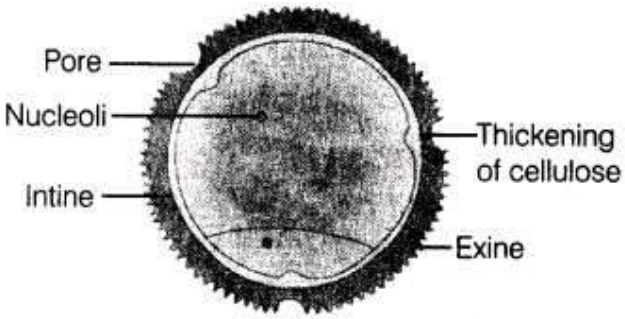
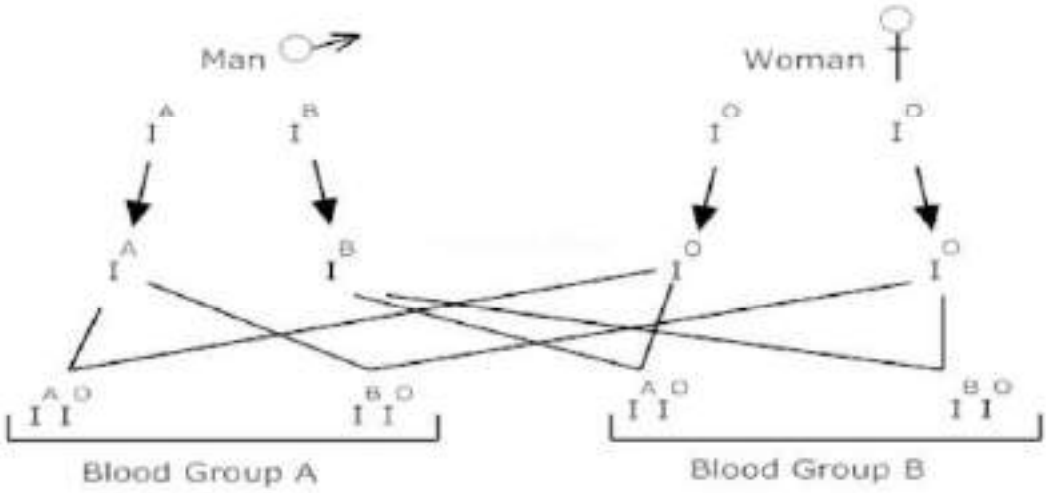


Diagram and labeling …..2 mark

ii)Sporopollenin is one of the hardest or resistant organic material known. It can withstand high temperatures, strong acids and alkalis. No enzyme that degrades sporopollenin is so far known.That's why it is considered the most resistant organic material

……..1 mark

29. a)



Half of the progeny will have blood group A with genotype IA, IO **……..1 mark**

Half of the progeny will have blood group B with IB, IO **……..1 mark**

b) IA and IB genes are dominant over IO gene. Hence the progeny shows blood group A or B. This phenomenon is called co dominance. **……..1 mark**

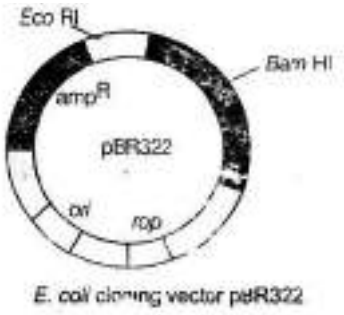
30.

Properties	Spermatogenesis	Oogenesis
Definition	The main feature is the production of the sperms from spermatogenesis.	The main feature is the production of the ovum from oogenesis.
Stages	All the stages take place in the testis.	Not all only the last stage of oogenesis takes place in the oviduct.
Location	Spermatogenesis is located in the testis of males.	Oogenesis is located in the ovary of females.
Growth	The growth phase is short.	The growth phase is extended.
Production rate	The production of sperms is in millions every day.	Only one ovum is released once a month.
Release	The sperms are released from the testis.	The ova are released from the ovary.

Cell division	The division is equal and helps in the formation of four haploid spermatids.	The division of the cell is unequal and helps in the formation of one haploid ovum and two polar bodies.

……Any 3- each carries 1 mark

OR



E. coli cloning vector pBR322

Diagram with labeling…..**1½ mark**

Explanation……....**1½ mark**

31.

Development of endosperm

(i)Embryo development occurs after endosperm development in angiosperms.

(ii) The three methods of endosperm development are:
(a)nuclear type (b) cellular type
(c)helobial type

(iii) Nuclear type is the common method in which triploid Primary Endosperm Nucleus (PEN) undergoes repeated mitotic division without cytokinesis. This stage is called free-nuclear endosperm.

(iv)Cell wall formation starts from the periphery and the endosperm becomes completely cellular, e.g. coconut, rice, etc.
(v)Cells of the endosperm store food materials.

(vi)Endosperm may be completely utilised by the developing embryo before the maturation of seeds as in pea, bean, mustard, etc. These seeds are called non-albuminous or endospermic seeds.

(vii) In seeds like castor, maize, coconut, rice, etc., a portion of it may remain in the mature seeds, such seeds are called albuminous or endospermic seeds

……..2 ½ mark

Embryo development in dicot plant

(i) Embryo formation starts after a certain amount of endosperm is formed.

(ii) Zygote divides by mitosis to form a proembryo.

(iii) Formation of globular and heart-shaped embryo occurs which finally becomes horse shoe-shaped mature embryo.

(iv) In dicot plant, embryo consists of two cotyledons and an embryonal axis between them.

(v)The portion of embryonal axis above the level of attachment of cotyledons is epicotyl and terminates in the plumule.

(vi)The portion of embryonal axis below the level of attachment of cotyledon is the hypocotyl, it becomes radicle (root tip).

……..2 ½ mark

OR

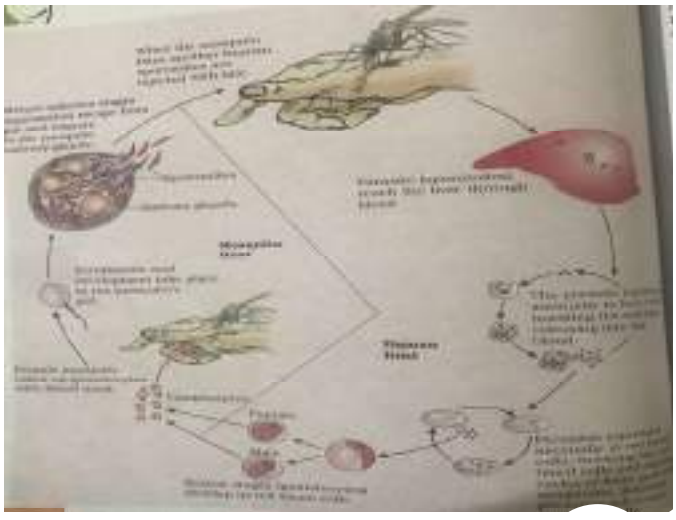
Initiation

Elongation

Termination **Explanation of each point……..1 mark**

Diagram ……..2 mark

32.



Life Cycle of Plasmodium

- Plasmodium enters the human body as sporozoite through the bite of infected female anopheles mosquito
- Parasite multiply in the liver cell and attack the RBC resulting in their rupture
- Rupture of RBC associated with a release of toxin called haemozoin
- When female mosquito bites the infected person these parasite enters into the mosquitos' body and undergo further development.
- These parasites multiply as sporozoite and stored in their salivary gland.
- When these mosquitoes bite a human the sporozoites are introduced into their body, there by initiating the event again
- Malarial parasite requires two hosts – Human and mosquito to complete their life cycle.

Diagram 1 ½

Explanation 3 ½

OR

(i) Menstrual phase - first 3-5 days of the cycle where menstrual flow occurs due to break down of endometrial living of uterus if the released ovum is not fertilised.

(ii) Follicular phase - from 5^{th} to 14^{th} day of the cycle where the primary follicles grow to become a fully mature rapture Graafian follicle, the endometrium of uterus regenerates, Graafian follicle ruptures to release an ovum.

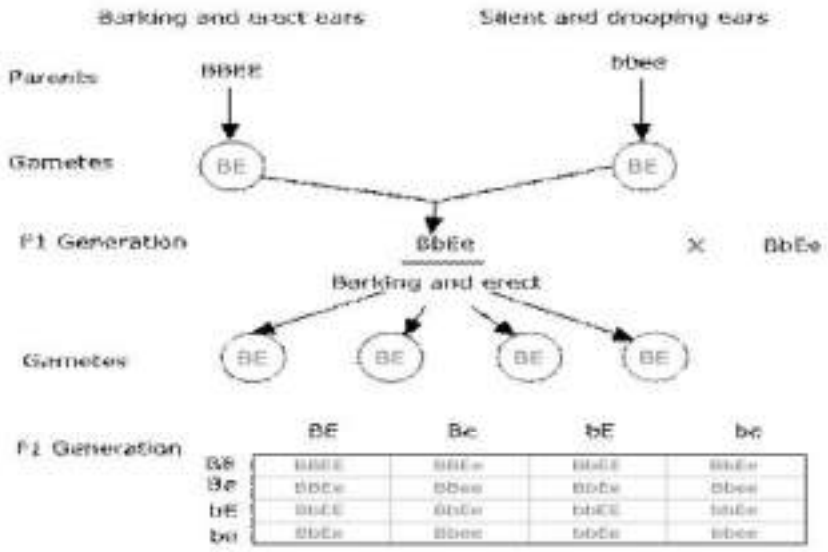
(iii) Luteal phase - During 15^{th} to 28^{th} day remaining parts of Graafian follicle transforms into luteum, secretion of progesterone. **……1 mark for each point**

All these phases are under the influence of varying concentration of pituitary and ovarian.

(b) Yes, A proper understanding of the menstrual cycle can help immensely in family planning as it takes appropriate precautions between 10^{th} to 17^{th} day of the menstrual cycle where the chemical of fertilisation is high. **…….2 mark**

33.

Ans.



Ration :- Barking & erect = 9

Barking & drooping =3

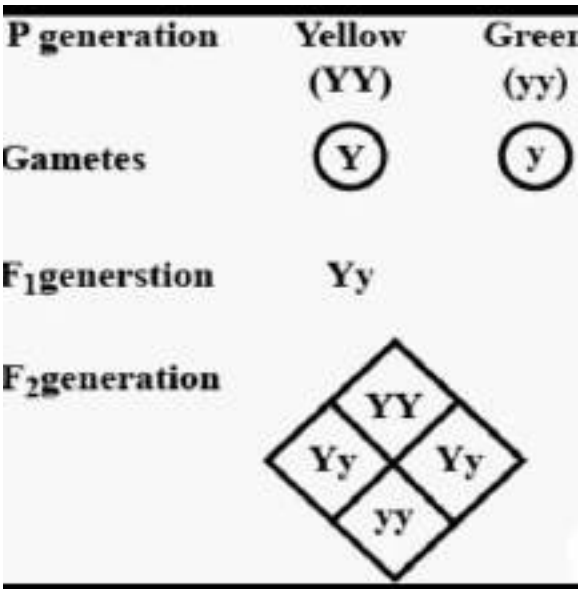
Silent & erect = 3

Silent & drooping =1

Phenotypic ratio = 9 : 3 : 3 : 1

……..5 mark

OR



……..2 mark

a) The figure given above shows the F_1 and F_2 generations of a monohybrid cross for the seed coat colour trait in *Pisum sativum*. **……..1 mark**

b) This cross depicts the law of segregation which states that during the formation of gametes each pair of gametes segregates independently of the other pair of gametes **. ……..1 mark**

c) For a monohybrid cross, the phenotypic F_2 ratio is 1:2:1 while that for dihybrid cross is 9:3:3:1. **……..1 mark**

MARKING SCHEME

1. (b) Internship training
2. (b) Measurement of actual performance
3. (b) Commercial paper
4. (b) Right to be informed
5. (d) Branding
6. (a) Relativity
7. (b) Functional structure
8. (b) Accountability
9. (b) Marketing Planning
10. (c) Product
11. (b) Financial leverage

    OR

    (b) Investment decision
12. (d) Selling concept

    OR

    (a) (ii), (i), (v), (iii), (iv)
13. (a) Political Environment
14. (b) Legal Environment
15. (a) Technological Environment
16. (b) Social Environment
17. (a) Full fledged
18. (a) Equity
19. (c) Espirit de Corps
20. (b) Order
21. The following steps of controlling are discussed in the given case:
    (i) Setting up of performance standards: The first step of controlling process is to set up the quantitative standards. As in the given case assembling of 1000 units per day is set as quantitative standards for the workers to achieve.
    (ii) Measuring the actual performance: Once the standards have been set, the next step is to measure the actual performance. Assembling of 800 units of Air conditioners per day is the actual performance in the given case.
    (iii) Comparing the actual performance with standards: The next step in controlling process is to compare the actual performance with standard performance. Such comparisons will reveal the deviations. In the above case the deviation is of 200 are conditioners.
22. The process of staffing after a candidate gets selected is following :
    (i) Employment interview: Interview is conducted to have a detailed conversation with the applicant for measuring his suitability for the job.
    (ii) Reference and background checks: More information about the candidate is gathered from indirect personal sources like previous employers, teachers, university professors, etc. Often employers ask for references with names, addresses and contact numbers of people to verify information provided by the applicant. References help the employer to acquire more information about the candidate.

(iii) Selection decision: The employer then chooses the best candidates out of those who clear the tests, interviews and reference checks.
(iv) Medical examination: After selection, a candidate undergoes a medical fitness test.
(v) Job offer: Appointment letter is given to the candidate confirming the place and date of starting his job. The candidate is expected to report on the mentioned date.
(vi) Employment contract: This includes the terms and conditions applicable to both—the employer as well as the employee. The contract includes detailed information about remuneration, duty hours, rules and regulations, allowances, etc.

23. It ensures maximum production at minimum cost and getting best contribution from every factor: Time study fatigue study + method study + motion study.
(i) Time Study is the technique to determine the standard time taken by a worker of average skill and knowledge to complete a standard task.
(ii) Fatigue study seeks to determine the amount and frequency of rest intervals required in completing a task.
(iii) Method study seeks to find out one best way of doing the job.
(iv) Motion study refers to the study of movements of limbs which are undertaken while doing a typical job. This helps to eliminate unnecessary movements so that it takes less time to complete the job efficiently.

OR

The significance of Principles of Management are as follows:
(i) They help to provide managers with useful insights into reality and increase their efficiency in dealing with recurring problems.
(ii) They ensure optimum utilization of resources as due to the presence of cause and effect relationship the outcome of the decisions and actions can be predicted. Moreover, it leads to effective administration as the principles tend to restrict the personal prejudices and biases.
(iii) They facilitate scientific decision- making as they emphasize on logical thinking rather than blind faith.
(iv) They help to meet the changing requirements of the environment to the best advantage of an organization.

24. Mohit should follow the following principles of managerial control while analyzing deviations:
(i) Critical point control: According to this principle of managerial control, a manager should focus on Key Result Areas (KRAs) that are critical to the success of an organization. A manager should not waste his precious time on checking each and every activity in the organisation. He should focus on those areas which are critical to the success of the enterprise. In the above case Mohit should focus on improving the performance of the machinery either by repairing it or by replacing it with the new one. Marginal increase in stationery expenses can be dealt later by him.
(ii) Management/Control by Exception: As per this principle of managerial control, a manager trying to control everything may end up controlling nothing. Therefore, only significant deviations that go beyond the permissible limit should be brought to the notice of management. In the above case poor performance of machinery needs immediate managerial attention.

25. (a) The objective of setting up SEBI are outlined below :
(i) To prevent trading malpractices in the securities markets.
(ii) To protect the rights and interest of investors and to guide and educate them.
(iii) To regulate and develop a code of conduct and fair practices by intermediaries like brokers, merchant bankers, etc. with a view to making them competitive and professional.
(iv) To regulate stock exchanges and the securities market to promote their orderly functioning.
(b) Protective function is performed by SEBI: "The SEBI has imposed a penalty of ` 400 crores on Ashiyana Homes Ltd

26. Importance of planning function of management is as follows:
(i) There are many risks and uncertainties involved in any business. Planning can enable foreseeing such risks and uncertainties by considering necessary precautions for the business. Accordingly, planning can reduce costs of damage to life and property.
(ii) It enables creativity and innovation among managers and subordinates who can come up with new ideas for improving efficiency in business. Planning involves identifying the best alternatives out of many options that also encourages satisfaction among the employees and eventually success to the organization.
(iii) Planning makes availability of resources to be utilized optimally by businesses. It helps in reducing wastage of resources and avoids duplication of efforts thus, increasing efficiency and effectiveness of the business' operations.

27. Importance of Planning is following :
(i) Planning provides direction as it acts as a guide for deciding what course of action should be taken to attain the organisational goals.
(ii) Planning reduces the risk of uncertainty arising due to the dynamic nature of business environment as it enables a manager to anticipate and meet changes effectively.
(iii) Planning reduces overlapping and wasteful activities as it serves as the basis for coordinating the activities and efforts of different divisions and individuals.
(iv) Planning promotes innovation as it encourages new ideas that can take shape of concrete plans.
(v) Planning facilitates decision- making as it enables a manager to choose the best alternative course 'of action among the various available alternatives in light of present and future conditions.
(vi) Planning establishes standards for controlling. Planning provides standards against which the actual performance is measured and timely corrective actions are taken.

OR

Features of Planning are following:
(i) Planning focuses on achieving objectives by deciding upon the activities to be undertaken.
(ii) Planning is a primary function as it precedes all functions of management i.e., organising, staffing, directing & controlling.
(iii) Planning is pervasive as it is required at all the levels of management but its scope may vary.
(iv) Planning is continuous as plans need to be made on a continuous basis till an organization exists.

(v) Planning is futuristic as it seeks to meet future events effectively to the best advantage of an organization. Planning is, therefore, called a forward-looking function.
(vi) Planning involves decision-making as it involves rational thinking to choose the best alternative among the various available alternatives in order to achieve the desired goals efficiently and effectively.

28. (a) Divisional structure should be adopted by the diversified organization to enable it to cope with the emerging complexity.
Reason: It leads to faster decision making, promotes flexibility and initiative because each division functions as an autonomous unit.
(b) The two limitations of divisional structure are as follows:
(i) There may be conflicts among the different divisions heads as in pursuit of higher profits, each of them may seek maximum allocation of resources at the cost of other divisions.
(ii) The cost is high as each division is provided with separate set of similar functions not find enough time to take care of all functional activities. At the same time, they are not in position to afford professional managers.

OR

Introduction: Management is as old as the organizations are but the systematic study of management started in the beginning of the 20th century. Management is not pure science; it is an art too.
Meaning: Management is an activity which a course of action to achieve specific result. Management as a group refers to all those persons who are involved in managing an organization.
Characteristics of Management are as follow:
(i) Management as goal -Oriented process.
(ii) Multidimensional
(iii) Complex process
(iv) Dynamic process
(v) Social Process
(vi) Continuous process
Objectives of management are the end results that it seeks to achieve. The end results which management seeks to achieve in an organization in the form of achieving the following objectives:
(i) Organizational objectives
(ii) Individual objectives
(iii) Social objectives
(i) Individual objectives: In an organization, individual or personal objectives emerge because individuals join it to satisfy their need. Thus it must include:
(a) Fair and equitable remuneration for work performed.
(b) Reasonable job security.
(c) Training and development facilities.
(d) Opportunity for promotion.
(e) Recognition of good work.

29. Importance of management(any four points)

30. a. allocative function
    b. money market, differences between primary market and secondary market
31. Decentralisation
    Importance of Decentralisation:
    (a) Develops Initiative among Subordinates: Decentralisation helps the lower level manager to take all those decisions, which are for the improvement of enterprise, on their own and to develop appropriate solutions for solving different kinds of difficulties they face. This help in increasing confidence and self-reliance among the subordinates.

    (b) Develop Managerial Talent for the Future: Under decentralisation, managers working at middle and lower level learn the art to take independent decisions. Decentralisation provides them a chance to prove their talent by handling various assignments independently.
    (c) Quick Decision Making : In a decentralised organisation decision-making is not restricted in few hands only but decision- making power is entrusted to all the managers who are performing the activities. As a result, more accurate and quick decisions can be taken as employees are well aware of the realities of the situation.
    (d) Relief to Top Level Management: In a decentralised organisation, the authority to take routine operational decisions is delegated to the middle and lower level of management. As a result, top level managers relieve themselves from routine matters and consequently the work load is reduced.
    (e) Facilitate Growth: Decentralisation provides considerable liberty to the managers at lower level. This allows them to do the work in a manner best suited to their department. When each department is doing best then the overall productivity increases and organisation is able to generate more revenues which can be used for growth and expansion purposes.
    (f) Better Control: Decentralisation helps to evaluate the work performance at each level of management. Managers working at various levels are allowed to take their own decisions and they are personally accountable for their decisions. They cannot pass the blame to their employees.
32. The five factors which will help Seema, in taking the dividend decision are described below:
    (i) Earnings: Since the dividends are paid out of current and past earnings, there is a direct relationship between the amount of earnings of the company and the rate at which it declares dividend. If the earnings of the company are high, it may declare a higher dividend or vice-versa.
    (ii) Cash flow position: Since the dividends are paid in cash, if the cash flow position of the company is good it may declare higher dividend or vice-versa.
    (iii) Access to capital market: If the company enjoys an easy access to capital market because of its credit worthiness. It does not feel the need to depend entirely on retained earnings to meet its financial needs. Hence, it may declare higher dividend or vice-versa.
    (iv) Growth prospects: If the company has any forthcoming investment opportunities, it may like to retain profits to finance its expansion projects. This is because retained profits are considered to be the cheapest source of finance as it doesn't involve any explicit costs. Hence, it may declare lower dividend or viceversa.
    (v) Preferences of the shareholders: The companies paying stable dividends are always preferred by small investors primarily if they want regular income in the form of 'stable

returns' from their investments. Large shareholders may be willing to forgo their present dividend in pursuit of higher profits in future. Therefore, the preferences of the shareholders must be taken into consideration.

OR

The working capital requirements of Hemant will be less as he is engaged in trading business. The two factors that will affect his fixed capital requirements when he will start his own bread factory are described below:

(a) Level of collaboration: If Hemant gets an opportunity to set -up his factory in collaboration with another enterprise, his fixed capital requirements will reduce considerably else his fixed capital requirements will be more.

(b) Financial alternatives available: If Hemant is able to get the place to start the factory and machinery on lease, his fixed capital requirements will reduce considerably. Whereas if he decides to purchase them, his fixed capital requirements will be more.

33. (a) Campus Recruitment is the source of external recruitment adopted by the company.

(b) The advantages of using the external sources of recruitment are stated below:

(i) Qualified Personnel: Through the external sources of recruitment, the management is able to attract qualified and trained people to apply for the vacant job positions in the organisation.

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(ii) Wider Choice: As the vacancies are advertised widely a large number of applicants from outside the organisation are likely to apply. This gives the organization a wider choice while selecting the people for employment.

(iii) Fresh Talent: The organizations cannot fulfil all the vacancies from within the organization. Therefore, by using the sources of external recruitment they get a wider choice and it brings new blood into the organization.

34. Consumer Rights : Three rights of consumer under Consumer Protection Act:

1. Right to Safety:

(a) The consumer has a right to be protected against goods and services which are hazardous to life and death.

(b) For instance, electrical appliances which are manufactured with substandard products or do not confirm to the safety norms might cause serious injury.

(c) Thus, consumers are educated that they should use electrical appliances which are ISI marked as this would be an assurance of such products meeting quality specifications.

2. Right to be informed:

(a) The consumer has a right to have complete information about the product he intends to buy including its ingredients, date of manufacture, price, quality, directions for use, etc.

(b) It is because of this reason that the legal framework in India requires the manufactures to provide such information on the package and label of the product.

3. Right to Choose:

(a) The consumer has the freedom to choose from a variety of products at competitive prices.

(b) This implies that the marketers should offer a wide variety of products in terms of quality, brand, prices, size, etc. and allow the consumer to make a choice from amongst these.

KOCHI METRO SAHODAYA
AISSCE MODEL EXAMINATION CLASS - XII (2020-2021)
MARKING SCHEME
CHEMISTRY (043)

1. (i) c
   (ii) d OR qn c
   iii) a
   iv) b
2. i) a
   ii) a
   iii) c
   iv) d
3. b
4. d
5. c
6. c
   OR
   C
7. b
   OR
   b
8. c
   OR
   C
9. b
10. b
11. a
12. a
13. b
14. c
    OR
    C
15. d
16. d
17. Cl is electron withdrawing group due to –ve Inductive effect ,hence act as deactivating group.
    Cl increases electron density of benzene ring at ortho and para position due to +ve Resonance effect.
    OR
    i) Ethane + Cl_2(light)→C_2H_5Cl
    $2C_2H_5Cl + Na$(dry ether)→ Butane (1)
    ii) $C_6H_5Br + Na + CH_3Br$ (dry ether)→Toluene (1)
18. $\Delta T_f = K_f \times m = \frac{K_f \times w_2 \times 1000}{M_2 \times w_1} = 2.25K$ (1)

f.p. of solution =T_f° - ΔT_f = 273.15 – 2.25 =270.9k\K (1)

19. ON= +2 , $e^4 t_2^3$ (½+ ½)
    Tetrahedral , paramagnetic (½+ ½)
    OR
    $[NiCl_4]^{2-}$ ON=+2 , $3d^8$,Cl^- is a weak ligand, no pairing of d elecrons , sp3 , 2 unpaired electrons ,paramagnetic (1)
    $[Ni(CO)_4]$, ON=0 ,$3d^8\ 4s^2$, CO is a strong ligand ,forces pairing of 4s electrons in 3d-orbitals ,no unpaired electrons ,diamagnetic. (1)
20. Ref text part
    OR
    r= k $[A]^1[B]^0$ (1)
    order= 1 (1)
21. k= .693/30 = .0231min-1 (1)
    t = 2.303/.0231 log 10 = 99.69min (1)
22. Ref text part
23. Bp=3 , lp=2 ,expected geometry for 5bp is trigonal bipyramidal
    lp-lp repulsion> lp-bp repulsion> bp-bp repulsion
    In order to reduce lp-lp repulsion and lp-bp repulsion, lp occupy equatorial position
    Shape : bent T- shape
24. Zaitsev rule ref text (½)
    2-Methylbut-1-ene , 2-Methylbut-2-ene (½+ ½)
    Major alkene : 2-Methylbut-2 -ene (½)
25. Vacancy defect (1)
    Density decreases (½+ ½)
26. i) Zr and Hf have similar size due to lanthanoid contraction. Hence similar properties
    ii)In CuCl, Cu^+ion with $3d^{10}$, no unpaired electrons,no d-d transition,colourless
    In $CuCl_2$, Cu^{2+} ion with $3d^9$, one unpaired electron, so coloured.
    iii)Fe :3d6 4s2 ,4 unpaired electrons,hence stronger interatomic metallic bonding,higher melting point
    Cu: 3d10 4s1 ,only 1unpaired electron ,weaker metallic bonding, so low mp.
    OR
    i) standard electrode potentials($E^\circ_{M^{2+}/M}$) of elements in 3d series become less –ve from left to right
    ii) E° value of Cu is +ve, so Cu cannot displace H_2 from acids.
    iii) Due to extra stability of half filled($3d^5$) and completely filled($3d^{10}$) configuration in Mn^{2+} and Zn^{2+} respectively.
27. i)Aryl halides are less reactive towards SN reaction.
    ii)1° amines are associated through intermolecular H-bonding which is absent in 3° amines.
    iii) Alkyl groups are EDG, increases electron density on N atom
    Aryl groups are EWG, decreases electron density on N atom

28. No. of atoms per unit cell, z =8x1/8 +2 =3 ½

Density= $\frac{zM}{a^3N_A}$ = $\frac{3xM}{24x10^{-24} x6.022x10^{23}}$

M = 34.69g (1 ½)

34.69g contain $6.022x10^{23}$ atoms

200g contain=$\frac{6.022x10^{23}x200}{34.69}$ = $3.47x10^{24}$ atoms (1)

29. i) dispersion medium gas eg.clouds

ii) dispersion medium water eg. Starch sol

iii)dispersed phase and dispersion medium are liquids eg. Milk

30.i) ref text

ii)Xe and Kr are larger and have low ionisation enthalpy

iii)HI , I is large and low bond enthalpy for H-I

31. A is NaCl ,B is HCl , C is Cl_2 , D is I_2 (2)

$2\ NaCl + H_2SO_4 \rightarrow Na_2SO_4 + 2HCl$

$HCl + AgNO_3 \rightarrow AgCl + HNO_3$

$AgCl + 2NH_4OH \rightarrow [Ag(NH_3)_2]Cl + 2H_2O$

$2NaCl + MnO_2 + 3H_2SO_4 \rightarrow 2NaHSO_4 + MnSO_4 + Cl_2 + 2H_2O$

$Cl_2 + 2KI \rightarrow 2KCl + I_2$ (3)

OR

a) i) $H_2O < H_2S < H_2Se < H_2Te$

ii) $BiH_3 < SbH_3 < AsH_3 < PH_3 < NH_3$ (1+1)

b) X= O_3 , Y= $PbSO_4$

$PbS + 4O_3 \rightarrow PbSO_4 + 4O_2$ (1+1+1)

32. A= C_6H_5CHO , B=$C_6H_5CH_2OH$,C= C_6H_5COONa , D= C6H6 (2)

$C_6H_5CHO + dil.\ NaOH \rightarrow C_6H_5CH_2OH + C_6H_5COONa$

$C_6H_5COONa + Sodalime \rightarrow C_6H_6 + Na_2CO_3$

$C_6H_5CH_2OH + (O) \rightarrow C_6H_5CHO$ (1+1+1)

OR

i) Ref text

ii) $CH_3Br + KCN \rightarrow CH_3CN$

$CH_3CN + H_2O/H^+ \rightarrow CH_3COOH$

iii) (a) Ethanal +NaOI → yellow ppt of iodoform

Propanal + NaOI → no yellow ppt

(b) Phenol $+Br_2/H_2O$ → white ppt

Benzyl alcohol + Br_2/H_2O → no white ppt

33. i) $\Delta G^\circ = -nFE^\circ_{cell}$ $=-6 \times 96500 \times 0.89 = -515310J$ (2)

ii) (a) $Cd + 2H^+ \rightarrow Cd^{2+} + H_2$ (1)

(b) $Ecell = \underline{E^\circ_{cell} - \frac{0.0591}{2} \log \frac{[Cd^{2+}]\, p_{H_2}}{[H^+]^2}} = 0.400V$ (2)

OR

i) $\Lambda^\circ_m(AgCl) = \Lambda^\circ_m(AgNO_3) + \Lambda^\circ_m(KCl) - \Lambda^\circ_m(KNO_3) = 138.4\ Scm^2/mol$ (2)

ii) $Ag(s) + Fe^{3+}(aq) \rightarrow Ag^+ + Fe^{2+}$

Not feasible since , $E^\circ_{Fe^{3+}|Fe^{2+}} < E^\circ_{Ag^+|Ag}$ (1)

iii) Cathode:

$Ag^+ + 1e^- \rightarrow Ag$

Anode: $Ag \rightarrow Ag^+ + 1e^-$ (2)

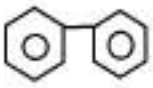
KOCHI METRO SAHODHYA MODEL QUESTION PAPER 2020-21

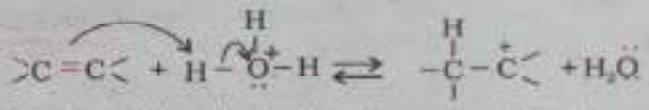
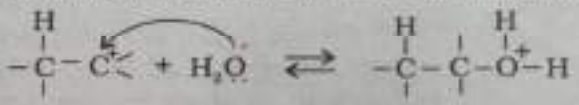
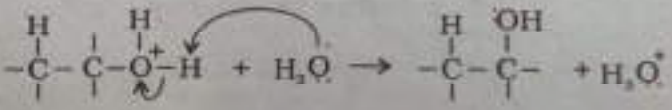
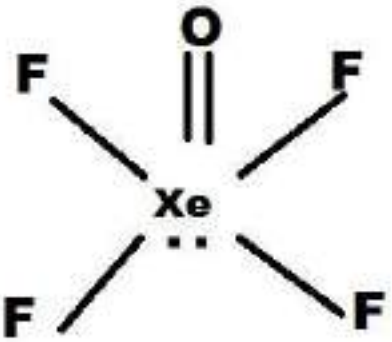
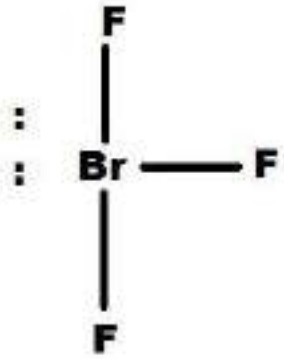
CHEMISTRY THEORY – (043)

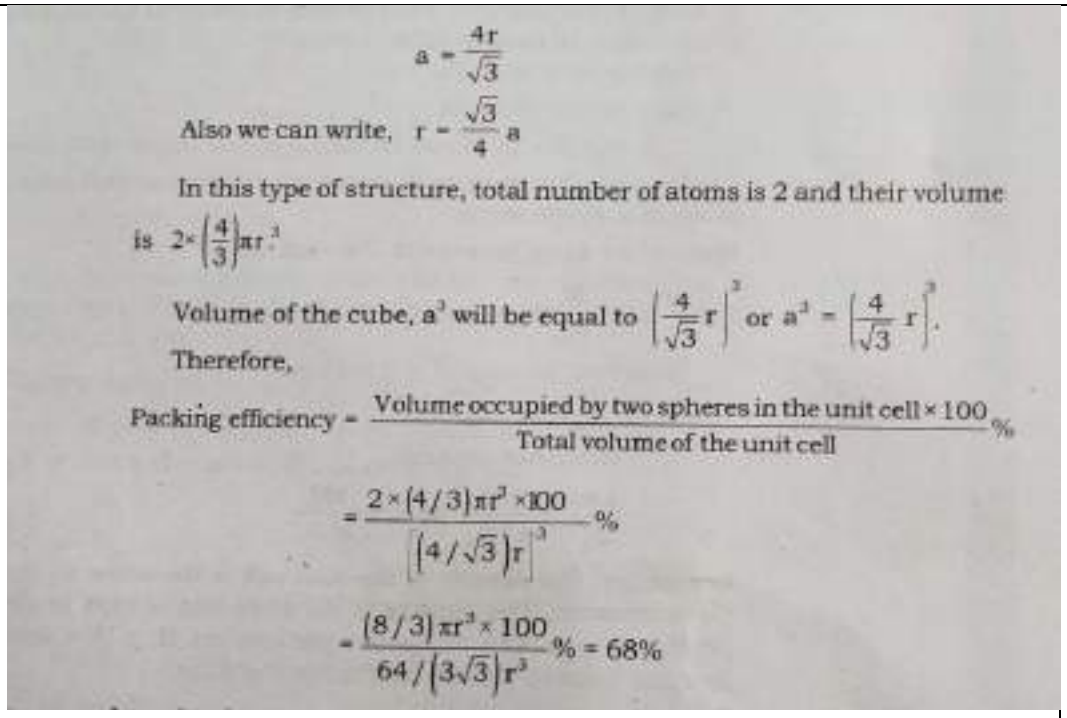
MARKING SCHEME

Qtn No	Value Point	Marks
1. i	b	1
ii	c	1
iii	c	1
iv	d	1
2. i	c	1
ii	a	1
iii	a	1
iv	C Or a	1
3	a	1
4	b OR b	1
5	d	1
6	b OR C	1
7	b OR C	1
8	a	1
9	b	1
10	d	1
11	a	1
12	b	1
13	b	1
14	a OR a	1
15	a	1
16	b	1

17	**a)** 2 bromopentane **b**) i)C6H5MgBr	1 ½

	ii.  +2NaBr **OR** **a**)$CH_3CH_2OH + SOCl_2$ ----→ CH_3CH_2Cl +KCN ------→CH_3CH_2CN b)CH_2=CH-CH_2-CH_3 + HBr(peroxide)------→ CH_2Br-CH_2-CH_2-CH_3 +NaI (dry acetone)--------→ CH_2I-CH_2-CH_2-CH_3	½ 1 1
18	$\Delta T_f = K_f \times (W_B/M_B) \times (1000/W_A)$ =1.86 x(31/62)x(1000/600) =1.48K	1 1/2 1/4+1/4
19	a)Potassiumhexacyanomanganate(II) b)Chelate effect is the enhanced affinity of chelating ligands for central metal ion compared to the affinity of non-chelating monodentate ligands for the same metal. Eg: Ethane-1,2-diamine. OR a)SP^3. Tetrahedral Paramagnetic b) dSP_2, lowspin diamagnetic, Square planar	1 1 1 1
20	a)Rate= $K[A]^1[B]^1$ b) Average Rate is the change in concentration over a selected period of time. Instantaneous rate is the rate at a particular time.	1 1
21	$K=(2.303/t)\log([R_o]/[R])$ $K=(2.303/40)\log(100/75)$ $(2.303/40)\log(100/75)=(2.303/t)\log(100/20)$ t=229.95 min	1 1/2 1/4+1/4

22	Step 1: Protonation of alkene to form carbocation by electrophilic attack of H_3O^+. $H_2O + H^+ \rightarrow H_3O^+$  Step 2: Nucleophilic attack of water on carbocation.  Step 3: Deprotonation to form an alcohol. 	1/2 1/2 1/2 1/2
23	 Square Pyramidal  T Shape	1+1
24	a) CH_3-CH_2-CH=CH_2 b) CH_3CN+ KBr	1 1

25	 $a = \frac{4r}{\sqrt{3}}$ Also we can write, $r = \frac{\sqrt{3}}{4}a$ In this type of structure, total number of atoms is 2 and their volume is $2\times\left(\frac{4}{3}\right)\pi r^3$ Volume of the cube, a^3 will be equal to $\left(\frac{4}{\sqrt{3}}r\right)^3$ or $a^3 = \left(\frac{4}{\sqrt{3}}r\right)^3$. Therefore, Packing efficiency = $\frac{\text{Volume occupied by two spheres in the unit cell}\times 100}{\text{Total volume of the unit cell}}\%$ $= \frac{2\times(4/3)\pi r^3\times 100}{\left(4/\sqrt{3}\right)r^3}\%$ $= \frac{(8/3)\pi r^3\times 100}{64/\left(3\sqrt{3}\right)r^3}\% = 68\%$	1 1/2 1/2

SECTION C

26	a) Copper(I)ion all orbitals are completely filled ($3d^{10}$). Therefore it is diamagnetic and white. Copper(II)ion has ($3d^9$) configuration. Hence, paramagnetic and coloured. b) Because of greater surface area and variable oxidation state. c) Because of completely filled d orbitals. OR On moving from La to Lu ,with the increase in atomic number ,atomic size decreases. Cause: 4f has poor shielding effect due to diffused size. Consequences: Separation of lanthanoid is possible and lanthanium hydroxide is more basic than butanium hydroxide.	1 1 1 1 1 1
27	a) i)Anilline responds for coupling reaction. P amino benzene(yellow dye) or reaction ii)Anilline responds for carbylamine test. $C_6H_5NH_2 + CHCl_3 + 3KOH \longrightarrow C_6H_5NC + 3KCl + 3H_2O$, Foul Smelling b)Butanol>Butanamine>Butane OR a) $CH_3COOH + NH_3$ (Heat)$\rightarrow CH_3CONH_2 + Br_2 + 4KOH \rightarrow CH_3NH_2$ b) $C_6H_5NO_2 + Fe + HCl \rightarrow C_6H_5NH_2 + NaNO_2 + HCl \rightarrow C_6H_5N_2Cl$ c) $C_6H_5N_2Cl + H_3PO_2 \rightarrow C_6H_6 + CH_3Cl + AlCl_3 \rightarrow C_6H_5CH_3 + alkKMnO_4$ (Heat) $\rightarrow C_6H_5COOH$	1/2+1/2 1/2+1/2 1 1 1 1
28	Density=(Z x Atomic mass)/(N_0 x a^3x 10^{-30})cm^3 10.5=(4 x Atomic mass)/(6.022 x 10^{23} x 407^3 x10^{-30})	1 1

	Atomic mass = 107.8g	1/2 +1/2
29	a) i) Because glucose does not have free aldehydic group. ii) because the sequence of bases has to be complimentary to each other. b)Nucleoside = base +sugar Nucleotide= base+sugar+phosphate (or Structure)	1 1 1
30	a)Reducing character increases from HF to HI. HI>HBr>HCl>HF b)Because in NH_3 intermolecular hydrogen bonding is there. c)Inter halogen compound is a molecule which contains two or more different halogen atoms and no atoms of elements form any other group.	1 1 1

SECTION D

31	a) Because it has the ability to take up oxygen from air and has the tendency to loose more electrons. b) Because small atomic size, high electronegativity, fluorine cannot act as central atom in higher oxoacids. c) Because size of noble gas increases from He to Rn and VanderWaal's force of attraction increases. d) Due to small size and high effective nuclear charge. e) Due to large atomic volume of Bi, Large nuclear charge, +5 oxidation state of Bi is less stable and has strong tendency to accept electron. Hence, strong oxidising agent. **OR** a) i. $CaSO_4$ +2HF ii. $[XeF_7]^-[K]^+$ iii. $I_2 + H_2O$ b). Because noble gases have stable configuration and weak interatomic forces. c) Because oxygen is of comparable size with that of hydrogen.	1 1 1 1 1 1 1 1 1 1
32	a) Because formaldehyde does not have any alpha hydrogen atom. b) Carbonyl group in carboxylic acid is not free because it is involved in resonance. c) Because of -I effect of nitro group. d) In case the medium is strongly acidic, then the ammonia derivative will be also protonated and will not be able to act as a nucleophile. e) As $NaHSO_3$ addition is reversible and due to steric factors.	1 1 1 1 1

	OR	
	a). i $RCH_2OH + PCC \rightarrow RCHO$	1
	ii. $RCOCl + H_2 (Pd/BaSO_4) \rightarrow RCHO + HCl$	1
	b). i $CH_3CHOHSO_3Na$	1
	ii. $CH_3CH = NOH$	1
	iii. CH_3CH_2OH	1
33	a)Molar conductivity of a solution at infinite dilution is known as limiting molar conductivity.	**1**
	b) Specific conductivity decreases with the decrease in concentration. Since the number of ions per unit volume decreases on dilution.	**1**
	c)	**1**
	$E_{cell} = E^0_{cell} - \frac{0.0591}{n} \log \frac{[Anode]}{[cathode]}$ $E^0_{cell} = E^0_{cathode} - E^0_{anode}$ $0.30V \Rightarrow -0.44V - (-0.74)$ $E_{cell} = 0.30 - \frac{0.0591}{6} \log \frac{[10^{-2}]^3}{[10^{-1}]^2}$ $E_{cell} = -3.97\ V$	**1** **1/2 +1/2**
	OR	
	a)The cell constant refers to the theoretical electrode consisting of two 1cm square plates kept 1cm apart.	1
	b) For weak electrolyte the more dilute solution the greater its molar conductivity, due it increased ionic dissociation.	1

c) $\Delta G^0 = -nFE^0_{cell}$

$\Rightarrow -6 \times 96500 \times 0.34$ — 1

$\Rightarrow -196860\,J$ — 1

$\Delta G^0 = -2.303RT \log K_c$

$\log K_c = \frac{-\Delta G^0}{2.303RT} = \frac{-(-196860)}{2.303 \times 8.314 \times 298}$ — 1/2

$\log K_c = 34.50$

$K_c = \text{Antilog } 34.50$

$= 3.17 \times 10^{34}$ — 1/2

MARKING SCHEME

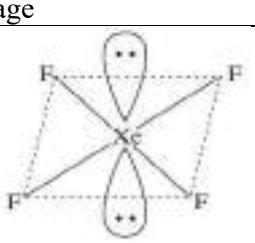
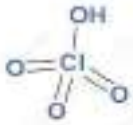
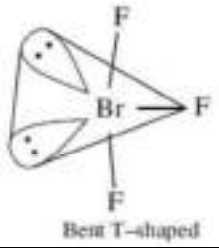
SAMPLE PAPER 1

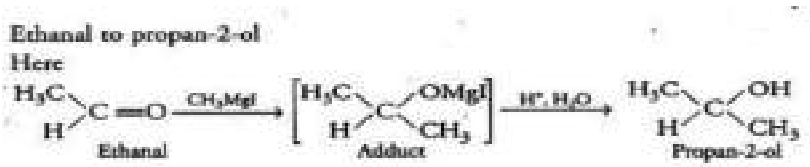
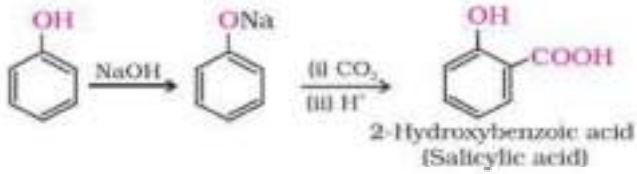
SECTION A

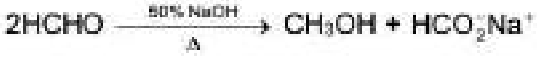
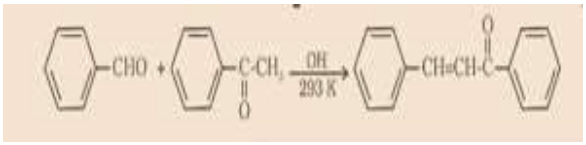
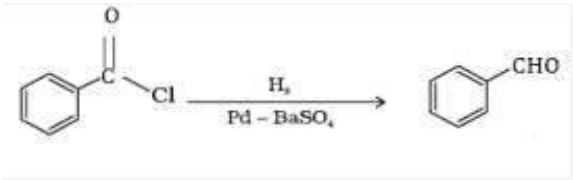
Q.No.	Value Point	Marks
1(i)	A	1
(ii)	B	1
(iii)	B OR A	1
(iv)	D	1
2(i)	A	1
(ii)	A	1
(iii)	C	1
(iv)	C	1
3	A	1
4	B OR B	1
5	D	1
6	B OR C	1
7	C OR B	1
8	A OR B	1
9	D	1
10	B	1
11	D	1
12	D	1
13	A	1
14	A	1
15	D OR A	1
16	C	1

Question No	Value Points	Marks
	SECTION B	
17	(i).The optical isomers which are non-superimposable mirror image of one another. ii) The molecule having atleast one assymetric centre and have non super imposable mirror image. **OR** The nucleophile having two nucleophilic centre but at a time only one will attach with electrophilic centre. eg: $CN^-$and NC^-, NO_2^- and ONO^- etc	1 1 1 1
18	At low temperature the vapour pressure is low, so the onions will not produce too much vapours. At room temperature vapour pressure is high , so more vapours are produced ,bringing tears on cutting onions.	2
19	i) [$Cr(H_2O)Cl_2.H_2O$ ii)pentaaquachloridochromium(III)chloride monohydrate OR The difference of energy between two sets of d-orbitals, ie t2g and eg as a result of crystal field splitting. It is because Δt is less because Δt crystal field splitting energy is less therefore, pairing does not take place and mostly tetrahedral complex are high spin and not low spin $\Delta t=4/9\ \Delta o$	1 1 1 1
20	i)$dx/dt=K[A]^2$ when concentration is reduced to half, then rate $=K[A/2]^2=1/4K[A]$.That is, the rate of reaction will becomes $1/4^{th}$ if concentration of reactant is reduced to half. (ii)units of k are L $mol^{-1}s^{-1}$ OR i)The slowest step among the elementary reactions determine the rate of reaction. ii)It is defined as the number of atoms or molecules or ions which must collide with each other simultaneously as to result in chemical reaction.	1 1 1 1
21	$t = \frac{2.303}{k} \log \frac{[A]o}{[A]}$ let $[A]o = a$ $[A] = (a-2/3a)=1/3a$, $k=5.48 \times 10^{-14}s^{-1}$ $t2/3 = \frac{2.303}{K} \log \frac{[A]o}{[A]}$ $= 2,303/5.48 \times 10^{-14} \log a/1/3a = 2.303/5.48 \times 10^{-14} \log 3$ $=2.303/5.48 \times 10^{-14} \times 0.4771 = 2 \times 10^{13}$ s	1/2 1/2 1/2 1/2
22	i) Warm each compound with iodine and sodium hydroxide . Phenol will not give yellow ppt whereas ethanol gives yellow ppt of iodoform.	1

	ii)Add Lucas reagent. Propan-2-ol will give turbidity after 5 minutes whereas 2-methyl-propan-2-ol will give turbidity immediately	1
23	i)F does not show higher oxidation state due to absence of d-orbitals. ii)It is due to weak vanderwaal's force of attraction between atom of noble gases.	1 1
24	i) $2C_6H_5Cl+Na \xrightarrow{\text{ether}} C_6H_5-C_6H_5+ NaCl$ ii) $CH_3-CHBr-CH_2-CH_3+KOH(alc) \rightarrow CH_3-CH=CH-CH_3+KBr+H_2O$	1 1
25	$Z=d \times a^3 \times N_A / M$ $= \frac{11.5 \times (300 \times 10^{-10}) \times 6.023 \times 10^{23}}{93}$ $= 2.010$ $Z \sim 2$ It has BCC , body centred cubic structure	1/2 1/2 1/2 1/2
	SECTION-C	
26	(i)Cr . It is due to presence of maximum number of electrons forming strong metallic bond (ii) Mn^{3+} is a strong oxidizing agent because it can gain one electron to form Mn^{2+} which is more stable due to half filled d-orbitals. (iii) Zn, because it does not have unpaired electron and has weak metallic bonds. **OR** (i) Sc shows only +3 oxidation state. (ii) The decrease in atomic and ionic radii with increase in atomic number is called lanthanoid contraction., Misch metal	1 1 1 1 1 1
27	(i) It is because H-bonds are stronger in alcohols than amines because 'O' is more electronegative than N. (ii) It is because primary amines can form H- bonds with water to more extent. (iii) $C_2H_5CH(CH_3)_2<CH_3(CH_2)_3CH_3<C_2H_5N(CH_3)_2<(C_2H_5)_2NH <C_4H_9NH_2$. **OR** (i) $CH_3CH_2NC+3KCl+3H_2O$ ii)$C_6H_5OH + N_2 +HCl$ (iii) $C_6H_5NH_3^+Cl^-$	1 1 1 1 1 1
28	i) LiCl when heated with lithium vapour, Li + becomes in excess which attract Cl- and the vacant position of anion is occupied by electron forming F- centre which absorbs light from visible region and radiate pink colour. ii) No. of Q atom = 8 x1/8 = 1 No. of P atom = 1 Therefore, Formula of compound is PQ	1 1 1

29	i) Fructose ii) Acidic Amino acids contain 2 Carboxylic acids groups and one amino group. Basic amino acid contain 2 amino and 1 carboxylic acid group. iii) Peptide linkage	1 1 1
30	i)  ii)  Perchloric acid iii)  Bent T–shaped	1 1 1
	SECTION – D	
31	i) Reducing character decreases from SO_2 to TeO_2 because the pΠ-pΠ bonds in them becomes weaker with increase in size and bond length along the group. ii) $HClO_3$ is a stronger acid than HClO because with increase in oxidation state and oxidation number the acidic character increases ie $HClO_3$ (+5) and HClO(+1) iii) Xenon forms compounds with fluorine and oxygen only due to their high electronegativity and reactivity . The first ionization energy of it is fairly close to that of O_2 and F_2. b. i) $XeO_2F_2 + H_2O \rightarrow XeO_3 + 2HF$ ii) $6\ XeF_4 + 12\ H_2O \rightarrow 4Xe + 2\ XeO_3 + 24HF + 3O_2$ OR a) Since the standard reduction potential of F is more than that of chlorine , so fluorine is stronger oxidizing agent. - Bond dissociation enthalpy of F_2 is less than Cl_2. -The negative electron gain enthalpy of fluorine is slightly less than chlorine. - The hydration enthalpy of fluoride ion is much higher than that of Cl^- ion due	1 1 1 1 1 1 1 1 1

	to more charge density of F^-. b) i) $H_2O < H_2S < H_2Se$ ii) $TeO_3 < SeO_3 < SO_3$	 1 1
32	i) a) Clemmensen reduction is a chemical reaction described as a reduction of ketones (or aldehydes) to alkanes using zinc amalgam and concentrated hydrochloric acid. $CH_3\text{-}CHO \xrightarrow[\text{Con. HCl}]{\text{Na-Hg}} CH_3CH_3$ b) HVZ reaction is the abbreviation for Hell-Volhard-Zelinsky reaction. It is a halogenation reaction i.e. addition reaction which adds one or more halogen to the compound. It halogenated carboxylic acids at the alpha carbon position. $CH_3{-}CH_2{-}COOH \xrightarrow[H_2O]{Cl_2/\text{Red P}} CH_3{-}CHCl{-}COOH$ ii) a.  b.  c. $HCHO + H\text{-}CH_2\text{-}CHO \xrightarrow{NaOH(dil)} H\text{-}\underset{\displaystyle OH}{\underset{|}{C}}\text{-}CH_2\text{-}CHO$ (OH below C)	1 1 1 1 1

	OR i) a) There is more positive charge on carbonyl carbon in case of CH3CHO but in acetone due to + I effect of two methyl group carboxyl carbon has less positive charge so less reactive towards HCN. b) Due to -I effect of nitro group, benzoate ion will be more stabilised so 4-nitrobenzoic acid is more acidic than benzoic acid. ii) a)  b)  c) 	1 1 1 1 1 1
33.	a) Λ_m =1000K/C = 1000 X 3.905 X 10^{-5} 0.001 =39.05 $Scm^2\ mol^{-1}$ $\Lambda^0 = \lambda^0_{H+} + \lambda^0_{CH3COO-}$ = (349.6 + 40.9) = 390.5 $Scm^2\ mol^{-1}$ $\alpha = \Lambda_m / \Lambda^0$ = 39.05/390.5 =0.1 α = 0.1 0r 0.1 x 100 = 10 % b) limiting molar conductivity is the maximum conductivity when solution is infinitely dilute, such that on further dilution there is no increase in Λ_m Conductivity decreases with decrease in concentration because number of ions per unit volume decreases. OR a) It states that the limiting molar conductivity of an electrolyte is equal to the sum of the individual contribution of the cations as well as the anion of the electrolyte. Application: It help in calculating Λ^0 of weak electrolyte at infinite dilution . b) Zn (s) → Zn^{2+} + $2e^-$ at anode Cu^{2+} + $2e^-$ → Cu at cathode n = 2 $\Delta G0 = -nFE^o$ = -2 x 96500 x 1.10 1000 = -212.3 $KJmol^{-1}$	1/2 1/2 1/2 1/2 1 1 1 1 1 1 1 1

MARKING SCHEME

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A has 2 sections:
   a. Section – I is short answer questions, to be answered in one word or one line.
   b. Section – II has two case studies questions. Each case study has 4 case-based sub-parts. An examinee is to attempt any 4 out of the 5 subparts.
4. Part - B is Descriptive Paper.
5. Part- B has three sections
   a. Section-I is short answer questions of 2 marks each in which two question have internal options.

   b. Section-II is long answer questions of 3 marks each in which one question have internal options.

   c. Section-III is very long answer questions of 5 marks each .

   All programming questions are to be answered using Python Language only

Question No.	Part-A	Marks allocated
	Section-I	
	Select the most appropriate option out of the options given for each question. Attempt any 15 questions from question no 1 to 21.	
1	The default separator character of print() is _____	**1**
Ans	Space	
2	Which of the following can be considered as valid identifiers? a)Hello-world2 b) _helloworld2 c) 2_hello world d) hello_world@1	**1**
Ans	b) _helloworld2	
3	[1,2] not in [1,2,3] returns _____	**1**
Ans	True	

4	Write a statement in Python to declare a dictionary D with 100 keys, 0,1…99, each having values as 200.	**1**
Ans	D=dict.fromkeys(range(100),200)	
5	A _____ function is used to write contents of file buffer onto storage file.	**1**
Ans	flush()	
6	Function range(10,5,-2) will yield an iterable sequence like _____ [10,8,6] b) [6,8,10] c) [9,7,5] d) [5,7,9]	**1**
Ans	[10,8,6]	
7	What is wrong with the following statement? n=input("number:") sqr=n*n	**1**
Ans	Reading number as a string type, two strings cannot be multiplied. Hence results in TypeError.	
8	_____statement abandons the current iteration of the loop.	**1**
Ans	continue	
9	What is the output of the following string operation? st="Computer Sciencs 12" print(st.isalnum())	**1**
Ans	False	
10	A tuple is declared as T = (23,8.6,'hello',41,'x'). What will be the value of T[:1:-1]?	**1**
Ans	('x',41,'hello')	
11	_____ protocol tells each system how to form mail messages and transfer them between computers.	**1**
Ans	SMTP	

12	Name the network device that takes a weak and corrupted signal and regenerates it.	**1**
Ans	Repeater	
13	Name the switching technique used for voice communication.	**1**
Ans	Circuit switching	
14	Which of the following is the fastest media of data transfer? Co-axial Cable b) Twisted pair Cable c) Fibre Optic d) None of these	**1**
Ans	c) Fibre Optic	
15	Consider the following statement. What type of statement is this? DROP TABLE school; a)DDL b)DML c) DCL d)TCL	**1**
Ans	a)DDL	
16	SSL is the abbreviation of _____.	**1**
Ans	Secure Sockets Layer	
17	In SQL, name the aggregate function that returns the number of records in a table.	**1**
Ans	count()	
18	What is the meaning of "GROUP BY" clause in Mysql?	**1**
Ans	Group data by column values	
19	Relation R1 has 10 tuples and 7 attributes. Relation R2 has 4 tuples and 5 attributes. When a NATURAL JOIN is achieved between R1 and R2, how many attributes would the resultant set have?	**1**
Ans	11	
20	In SQL, name the clause that is used to display the tuples in descending order of an attribute.	**1**

Ans	ORDER BY DESC	
21	Name the library required for database programming in Python.	**1**
Ans	mysql.connector	
	Section-II	
	Both the Case study based questions are compulsory. Attempt any 4 sub parts from each question. Each question carries 1 mark	
22	Consider the following table GRADUATE. Write SQL commands for the following statements (c) to (e) TABLE : GRADUATE	

ROLLNO	NAME	STIPEND	SUBJECT	AVERAGE	DIV
101	KARAN	400	PHYSICS	68	I
102	DIWAKAR	450	COMP Sc	68	I
103	DIVYA	300	CHEMISTRY	62	I
104	REKHA	350	PHYSICS	63	I
105	ARJUN	500	MATHS	38	IV
106	SABINA	400	CEHMISTRY	55	II
107	JOHN	250	PHYSICS	64	I
108	ROBERT	450	MATHS	68	I
109	RUBINA	500	COMP Sc	62	I
110	VIKAS	400	MATHS	57	II

	a) Identify the attribute best suitable to be declared as a primary key	**1**
Ans	ROLLNO	
	b) Write the degree and cardinality of the table GRADUATE	**1**
Ans	degree – 6 & cardinality - 10	
	c) Display the detail of all students who secured an average below 40	**1**
Ans	select* from graduate where average <40;	
	d) Display the name of those students whose name starts with 'D'.	**1**
Ans	select name from graduate where name like 'D%';	

	e) To increase the stipend of physics students by 100	**1**
Ans	update graduate set stipend+100 where subject=”physics”;	

23	Complete the following instructions to delete the details of a customer from a csv file ‘cust.csv’ which contain slno, customer name,city and amount.
	import _____
	record = list()
	custname= input("Please enter a customer name to delete:")
	with open('cust.csv', 'r') _____:
	  data = csv.reader(f)
	  for row in data:
	  record.append(row)
	  for field in row:
	  if field == custname:
	  record._____
	with open('cust.csv', 'w') as f:
	  writer = _____
	  writer._____(record)
		1
		1
		1
		1
		1

Ans	import csv
	record = list()
	custname= input("Please enter a customer name to delete:")
	with open('cust.csv', 'r') as f:
	  data = csv.reader(f)
	  for row in data:
	  record.append(row)
	  for field in row:
	  if field == custname:
	  record.remove(row)
	with open('cust.csv', 'w') as f:
	  writer = csv.writer(f)
	  writer.writerows(record)	

	Part – B	
	Section-I	
24	Evaluate the following expressions: a) 5 < (5>3 and 10<20) b) 3**2-81//9%2 + (3+4)	**2**
Ans	a) False b) 15	
25	What is the difference between LAN and Internet ? **OR** Briefly mention two advantages and two disadvantages of Star topology in network.	**2**
Ans	LAN is confined to one or nearby building but Internet has no specific geographical area. Internet is the collection of different LANs. It is the example of WAN. OR Advantages of Star Topology : (i) Ease of service : The star topology has a number of concentration point i.e., at the central node or at intermediate wiring closets. These provide easy occurs for service or re-configuration of the network. (ii) One device per connection : In star topology, failure of a single connection typically involves disconnecting one node from an other. Disadvantages of Star Topology : (i) Long cable length : Because each node in star topology is directly connected to the center, the star topology requires a large quantity of cable. (ii) Central node dependency : If the central node fails the network get failed.	
26	Expand the following terms: a) FDMA ii) POP iii) GSM iv) GPRS	**2**
Ans	a) Frequency Division Multiple Access b) Post Office Protocol c) Global System for Mobile Communication d) General Packet Radio Service	

27	Differentiate between a local variable and global variable. Give proper examples.	**2**

Ans	A variable declared inside a function body is known as a local variable. It is accessible only within the function in which it is declared.
	
	A variable which is declared outside all the functions is known as global variable. It is accessible throughout the program in which it is declared.
	
	N=100 #global variable
	def sample():
	a=10 #local variable
	print(a)
	print(N)	

28	Rewrite the following code in python after removing all error(s). Underline each correction done in the code. STRING=""HAPPY NEW YEAR" for S in range[0,14]: print STRING(S) STRING=STRING.lower	**2**

Ans	STRING="HAPPY NEW YEAR" #error_1
	for S in range(0,14): #error_2
	print(STRING[S]) #error_3
	STRING=STRING.lower() #error_4	

29	What are the possible outcome(s) executed from the following code? Also specify the maximum and minimum values that can be assigned to variable COUNT. Assume that the required modules are imported. txt="CBSEONLINE" COUNT =random.randint(0,3) c=9 while txt[c]!='L': print(txt[c]+txt[COUNT],end='*') COUNT = COUNT +1 c =c-1 i) EC*NB*IS* ii) NS*IE*LO* iii) EB*NS*IO* iv) ES*NE*IO*	**2**

Ans	i) EC*NB*IS* and iv) ES*NE*IO* Maximum value of COUNT: 3 Minimum value of COUNT: 0	
30	Differentiate between Data Definition Language and Data Manipulation Language.	**2**
Ans	DDL.DLL stands for Data Definition Language; It provides statements for creation and deletion of the database. DML stands for Data Manipulation Language. It provides statements for manipulating the database. It includes commands to insert, delete and modify tuples or records in the database.	
31	Differentiate between Candidate Key and Alternate Key in context of RDBMS with suitable example. **OR** Differentiate between Degree and Cardinality with suitable example.	**2**
Ans	Candidate key(s), which is not selected as Primary Key, is known as Alternate key(s). Alternate Key: All such attributes/columns, which can act as a primary key but are not the primary key in a table. **OR** Degree : It is the total number of attributes in the table. Cardinality: It is the total number of tuples in the table Any example	
32	Differentiate between fetchall() and fetchmany() methods with suitable examples for each.	**2**
Ans	fetchall() fetches all the rows of a query result. An empty list is returned if there is no record to fetch the cursor. fetchmany(n): it will return **n** number of records. If no more record it will return an empty tuple. Any example	

33	Find and write the output of the following Python code:
	
	def Mycode(Msg,ch):
	  s=""
	  for cnt in range(len(Msg)):
	  if Msg[cnt]>='P' and Msg[cnt]<='S':
	  s=s+Msg[cnt].lower()
	  else:
	  if Msg[cnt]=='N' or Msg[cnt]=='n' or Msg[cnt]==' ':
	  s=s+ch
	  else:
	  if(cnt%2==0):
	  s=s+Msg[cnt].upper()
	  else:
	  s=s+Msg[cnt-1]
	  print(s)
	Mycode("Input Raw","@")
		2

Ans	I@PpT@rRW	
	Section- II	
34	Write a user defined function in python SHIFT(lst) that would accept a list as argument .The function should shift the negative numbers of the list to right and the positive numbers to left without using a another list. For example if list initially contains [3, -5, 1, 3, 7, 0, -15, 3, -7, -8] Then after shifting list should contain [3, 1, 3, 7, 0, 3, -8, -7, -15, -5]	**3**

Ans	def SHIFT(lst):
	  n=len(lst)
	  print(lst)
	  for i in range(n-1):
	  for j in range(n-i-1):
	  if lst[j]<0:
	  lst[j],lst[j+1]=lst[j+1],lst[j]
	  print("List after shifting:",lst)	

35	Aditi has used a text editing software to type some text. After saving the article as WORDS.TXT, she realised that she has wrongly typed alphabet J in place of alphabet I everywhere in the article. Write a function definition for JTOI() in python that would display the corrected version of entire content of the file WORDS.TXT with all the alphabets "J" to	**3**

	be displayed as an alphabet "I" on screen. **Example**: If Aditi has stored the following content in the file WORDS.TXT: WELL, THJS JS A WORD BY JTSELF. YOU COULD STRETCH THJS TOBE A SENTENCE The function JTOI() should display the following content: WELL, THIS IS A WORD BY ITSELF. YOU COULD STRETCH THIS TOBE A SENTENCE	

Ans	def JTOI():
	f=open("WORD.txt","r")
	data=f.read()
	for c in data:
	if c=='J':
	print('I',end="")
	else:
	print(c,end="")
	f.close()	

36	Write the outputs of the SQL queries (i) to (iii) based on the relations Products and Suppliers given below:
	
	Table: **PRODUCTS**
	PID | **PNAME** | **QTY** | **PRICE** | **COMPANY** | **SUPCODE**
	101 | DIGITAL CAMERA 14X | 120 | 12000 | RENIX | S01
	102 | DIGITAL PAD 11i | 100 | 22000 | DIGI POP | S02
	104 | PEN DRIVE 16 GB | 500 | 1100 | STOREKING | S01
	106 | LED SCREEN 32 | 70 | 28000 | DISPEXPERTS | S02
	105 | CAR GPS SYSTEM | 60 | 12000 | MOVEON | S03
	
	Table: **SUPPLIERS**
	SUPCODE | **SNAME** | **CITY**
	S01 | GET ALL INC | KOLKATA
	S03 | EASY MARKET CORP | DELHI
	S02 | DIGI BUSY GROUP | CHENNAI
	
	i. SELECT SUPCODE, SUM(PRICE) FROM PRODUCTS GROUP BY SUPCODE;
	ii. SELECT PRICE * QTY AS AMOUNT FROM PRODUCTS WHERE PID=104;
	iii. SELECT PNAME,SNAME FROM PRODUCTS NATURAL JOIN SIPPLIERS WHERE QTY>100;
		3

Ans	i. SELECT SUPCODE, SUM(PRICE) FROM PRODUCTS GROUP BY SUPCODE;
	SUPCODE SUM(PRICE)
	S01 13100
	S02 50000
	S03 12000
	
	ii. SELECT PRICE * QTY AS AMOUNT FROM PRODUCTS WHERE PID=102;
	AMOUNT
	55000
	iii. SELECT PNAME,SNAME FROM PRODUCTS NATURAL JOIN SIPPLIERS WHERE QTY>100;
	PNAME SNAME
	DIGITAL CAMERA 14X GET ALL INC
	PEN DRIVE 16GB GET ALL INC	

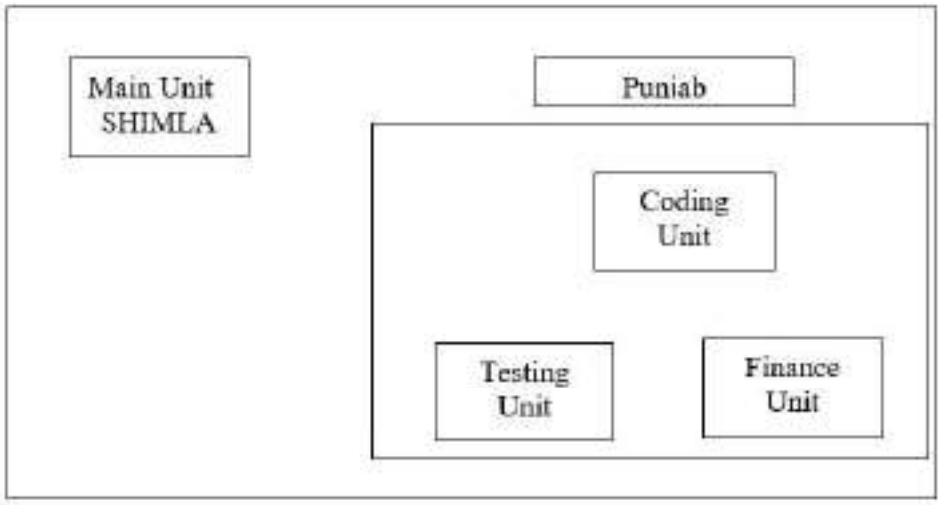
37	A linear stack called Books contains the following information: -Book Number ,name of the book and cost of the book Write **PUSH** (Books, N) method in python to add N book details each containing the above mentioned information's. Display the stack if it has at least one element, otherwise display appropriate error message. **OR** A linear stack called Books contains the following information of N Books: -Book Number ,name of the book and cost of the book Write a function in python DISPLAY(Books, N) to display all book details having price less than 500.	**3**

Ans	def **PUSH** (Books,N):
	for i in range(N):
	book_id=int(input("Enter the book Id:"))
	bookName=input("Enter the book name:")
	bookCost=float(input("Enter the cost:"))
	b=[book_id,bookName,bookCost]
	Books.append(b)
	if len(Books)==0:
	print("Empty stack")
	else:
	print(Books)
	OR
	def DISPLAY(Books, N)	

```
if Books==[]:  #len(Books)==0
   print("Underflow!!Stack is empty")
else:
   print("\nBook details (cost <500)\n----------------------")
   print("Book Id\tBook Name\tbook Cost")
   for i in range(N-1,-1,-1):
      book_id,bookName,bookCost= Books[i]
      if bookCost<500:
         print(book_id,"\t",bookName,"\t",bookCost)
```

Section-III

38 "AYS Software Inc." is planning to expand their network in India, starting with two cities in India to provide Software services. The company has planned to set up their main office units in Punjab at three locations and have named their offices as "Coding Unit", "Testing Unit" and "Finance Unit". The company has its corporate unit in Shimla. A rough layout of the same is as follows: **5**



Approximate distances between these Units are as follows:

From	To	Distance
Coding Unit	Testing Unit	16 KM
Coding Unit	Finance Unit	50 Mtr
Finance Unit	Testing Unit	10KM

In continuation of the above, the company experts have planned to install the following number of computers in each of their office units:

Coding Unit	100
Testing Unit	70
Finance Unit	10

i.Suggest the most suitable unit to install the server of the company with a suitable reason.

ii.Suggest the kind of network required (out of LAN,MAN,WAN) for connecting each of the following office units:

- Coding Unit and Testing Unit
- Coding Unit and Finance Unit

iii. Which one of the following devices will you suggest for connecting all the computers within each of their office units?

- Switch/Hub
- Modem
- Bluetooth

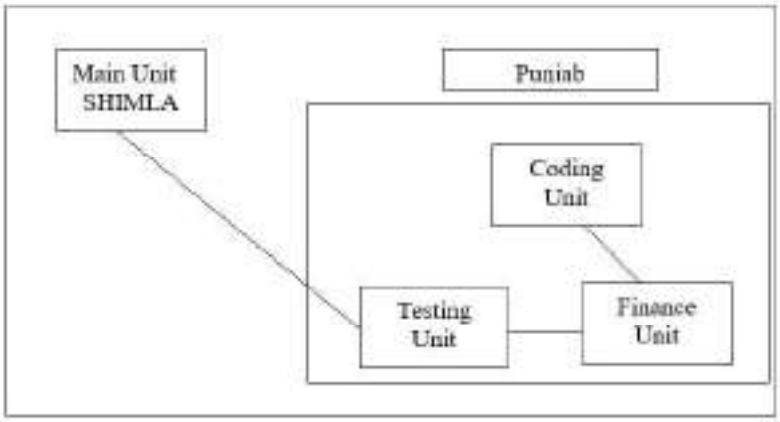
iv. Which of the following communication media, will you suggest to be procured by the company for connecting their local offices in Punjab for very effective (High Speed) communication?

- Coaxial cable
- Optical fiber
- Wi Fi network

v. Suggest a cable/wiring layout for connecting the company's local office units located in Punjab and Main Unit.

Ans	i. Coding Unit because maximum no: of systems ii. MAN, LAN iii. Switch iv.Optical Fiber	

v.Lay out



39 Write SQL commands for the following queries (i) to (v) based on the relations Stationary and Consumer given below: **5**

Table: **Stationery**

S_ID	StationeryName	Company	Price
DP01	Dot Pen	ABC	10
PL02	Pencil	XYZ	6
ER05	Eraser	XYZ	7
PL01	Pencil	CAM	5
GP02	Gel Pen	ABC	15

Table: **Consumer**

C_ID	ConsumerName	Address	S_ID
01	Good Learner	Delhi	PL01
06	Write Well	Mumbai	GP02
12	Topper	Delhi	DP01
15	Write & Draw	Delhi	PL02
16	Motivation	Bangalore	PL01

i. To display the details of those consumers whose Address is Delhi.

ii. To display the details of Stationery whose Price is in the range of 8 to 15. (Both Value included)

iii. To display the ConsumerName, Address from Table Consumer, and Company and Price from table Stationery, with their corresponding matching S_ID.

iv. To increase the Price of all Stationery by 2.

	v. To display average price amount of each comapny.	

Ans	i. Select * from consumer where adress=”Delhi”;
	ii. Select * from Stationery where price between 8 AND 15;
	iii. Select ConsumerName, Address , Company , Price from Consumer ,Stationery where Consumer.S_ID = Stationery.S_ID;
	iv. Update Stationery set Price = Price +2;
	v. Select avg(price) from stationary group by company;	

40	A binary file “GIFTS.DAT” has structure {" Gift_ID ":value, " Name ":value, " Remarks ":value, " Price ":value} i. Write a function BUMPER() in Python to read each record of a binary file GIFTS.DAT, find and display details of those gifts, which has remarks as "ON DISCOUNT". ii. Write a function TRANSFER( ) in python, that would copy all those records which are having price greater than 500 to “G_COPY.DAT”.	**5**

Ans	i.
	def BUMPER():
	import pickle
	f=open("GIFTS.DAT ","rb")
	try:
	print("Gifts remarks as "ON DISCOUNT"")
	while True:
	x=pickle.load(f)
	if x["Remarks "]=="ON DISCOUNT":
	print(x)
	except EOFError:
	pass
	f.close()
	
	ii.
	def transfer():
	import pickle
	fr=open("GIFTS.DAT ","rb")
	fc=open("G_COPY.DAT ","wb")
	try:
	while True:
	x=pickle.load(fr)	

```
        if x["Price "]>500:
            pickle.dump(x,fc)
            print(x)
    except EOFError:
        pass
    fr.close()
    fc.close()
```

CLASS XII - ECONOMICS (030)
Answer key

(Macro Economics)

1. (d) final consumer, finalproducer

OR

(b) $\text{Deflator} = \frac{GDP_{nominal}}{GDP_{real}} \times 100$

2. Central Bank
3. (c) fiatmoney
4. (c) C – (iii)
5. (c) Managed floating is also known as dirtyfloating.
6. (b) debit,capital
7. deflationarygap
8. (a)non-essential
9. more
10. (d) both (b) and(c)
11. (a) True. GDP growth as an index of welfare loses its importance if there is deep economic divide in the economy as economic divide indicates increasing gap between rich and poorpeople.
    (b) False. Real GDP increases only when there is increase in the quantity of output in the economy.
12. (a) False. The value of domestic currency will increase in relation to the currency of other country in case of appreciation. Thus, less rupees are to be paid for USdollar.

    (b) False. Flexible exchange rate is determined by the forces of demand and supply in the international money market.

    OR

    No,Thisstatementisrefuted.Devaluationisthefallinthevalueofdomesticcurrencyinrelationtoforeign currencyasplannedbythegovernment.Inotherwords,itoccurswhenthevalueofthedomesticcurrency is deliberately reduced by the government by raising the exchange rate. On the other hand, depreciation occurs when the value of the domestic currency reduces due to the market forces of demand and supply. Here, government plays no role. Thus, it is clear that both the terms are notsame.
13. Legaltendermoneyreferstomoneywhichcanbelegallyusedtomakepaymentofdebtsorotherobligations. Fiatmoneyreferstothatmoneywhichisissuedbyorderofthegovernment.Itmustbeacceptedforalldebts. Thus,itcanbesaidthatlegaltendermoneyisalsocalledfiatmoneybecauseithastobeacceptedasmoney aspertheordersofthegovernment.Itincludesallnotesandcoinswhichthepeopleinacountryarelegally bound to accept as a medium ofexchange.

14. (a) As 75% of the increase in income is spent onconsumption

Therefore, $MPC = \frac{\Delta C}{\Delta Y} = \frac{75}{100} = 0.75$

$K = \frac{1}{1-MPC} = \frac{1}{1-0.75} = \frac{1}{0.25} = 4$ here K = InvestmentMultiplier

Increase in income = Increase in investment × Multiplier

$\Delta Y = \Delta I \times K$

= 1,000 × 4

= ₹4,000 crore

Thus, Total increase in income (ΔY) = ₹ 4,000 crore

(b)Giventhat $\Delta Y = \Delta C + \Delta I$

Therefore, $\Delta C = \Delta Y - \Delta I$

=4,000−1,000

=₹3,000crore

Thus, Total increase in consumption expenditure (ΔC) = ₹ 3,000 crore

OR

The ratio between the change in consumption expenditure with the change in income is called Marginal Propensity to Consume. Marginal Propensity to Consume tells about the relationship between the change in consumption due to change in National income.

Marginal Propensity to Consume (MPC) = $\frac{\Delta C}{\Delta Y}$

Where, ΔC = Change in consumption expenditure

ΔY = Change in income

Relationship between Marginal Propensity to Consume (MPC) and Marginal Propensity to Save (MPS)– Sum of MPC and MPS is equal to 1. Thus, it can be explained as follows:

MPC + MPS = 1

or MPS=1−MPC

and MPC=1−MPS

15. Theabovementionedmonetaryinstrumentinnewsreportis CRR i.e. Cash Reserve Ratio. It is the minimum percentage of a bank's total deposits required to be kept with the RBI. It is fixed by RBI and changes from time to time to control the supply of money in the economy. When the supply of money is to be increased, then CRR is lowered and when the supply of money is to be reduced then it is to be raised.

Thus to control the situation of excess demand/inflation, it should be increased as it will reduce the supply of money and the problem of excess demand can be controlled.

On the other hand, CRR should be lowered to correct the situation of deficient demand as it will increase the supply of money.

In the given news report, CRR is reduced from 4% to 3% as they want to increase supply of money and want to solve the problem of deficient demand.

16. (a) This statement is true, so it is defended. GDP as an index of welfare of a country is not free from limitations. It also has some limitations which are as follows:
   (i) Distribution of GDP is not taken into account.
   (ii) Composition of GDP is not taken into consideration.
   (iii) Non-monetary exchanges are not recorded which underestimates the GDP.
   (iv) Externalities are not considered.

   (b)It is an intermediate expenditure for the firm because it involves purchase of services by one production unit (firm) from another production unit (lawyer). So, it will be deducted from the value of output of the firm to get the figure of value addition. So, it will not be included in national income.

OR

Net Domestic Product at Factor Cost (NDP_{FC})

= Compensation of Employees + Rent + Interest + Profit + Mixed Income of Self-Employed

= 3,000 + 600 + 700 + 1,000 + 8,000 = ₹13,300 crores

Net National Product at Market Price (NNP_{MP})

= NDP_{FC} – Net Factor Income to Abroad + Net Indirect Taxes = 13,300 – 60 + 500

= ₹13,740 crores

17. (a) It is a revenue expenditure as it neither creates asset nor reduce anyliability.
   (b) It is a revenue expenditure as it neither creates asset nor reduce any liability.
   (c) It is a capital expenditure as it creates an asset for thegovernment.

(Indian Economic Development)

18. **(a)** 1853
19. **(b)** socialisteconomy
20. **(c)** Assertion (A) is true but Reason (R) isfalse.

OR

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

21. **(d)** Assertion (A) is false but Reason (R) istrue.
22. **(d)** D-(iv)
23. **(b)**manufacturing
24. Diversification
25. allied
26. livelihood
27. Rabi
28. Thisstatementistrue.EconomicgrowthoccurswhenGDPriseswhichmeansincreaseinthelevelofoutput. It can be achieved in twoways:
    (i) through greater employmentand
    (ii) through bettertechnology
    Indevelopingcountrieslikeindia,economicgrowthbecomesmoreimportantwhenitisrelatedwithgreater opportunities of employment as there is massive unemployment and with employment opportunities, poverty can behandled.
    ButIndiaistakinganotheroptiontoincreaseGDPi.e.throughtechnologywhichcreatesasituationofjobless growth.

    OR

    Difference between Formal workers and Informal workers

Formal workers	Informal workers
1. These are those workers who are working in organised or formal sector.	1. These are those workers who are working in unorganised or informal sector.
2. They are entitled to social security benefits.	2. They are not entitled to social security benefits.
3. They are protected by various labour laws against uncertainties of the market.	3. They do not get any protection due to which they are highly vulnerable to uncertainties of the market.
4. They can form trade unions.	4. Trade union does not exist in informal sector.
5. They are like regular workers.	5. They are like daily wage workers.

29. Regional Rural Banks were established under the Regional Rural Banks Act, 1976. They provide loans to small and marginal farmers, agricultural labourers and artisans. The main objective of setting up RRBs is to provide financial facilities for development of agriculture and other productive activities in rural areas. The performance of the RRBs, however, has not been quite satisfactory due to poor recovery rates. Many sponsoringbankshadtheirownbranchesinruralareasandtherevenueearningcapacityofRRBswasvery poor due to various restrictions placed on them. The government, therefore, initiated a reform process of the RRBs in 2004, as a result of which the performance of the RRBs improved after2010.
30. This is true statement. British intended to achieve the following objectives through their policies of infrastructure.
    (i) Expansion of Indian market for the British products through the railwaysexpansion.
    (ii) To handle export of raw material to Britain and import of finished goods from Britain through the development ofports.
    (iii) To increase administrative efficiency through the development of post andtelegraphs.
    (iv) Tofacilitatetransportationofrawmaterialfromdifferentpartsofthecountrytotheportsthroughthe developments of roads.
    Thus,itisclearfromtheabovepointsthattheywerehavingpersonalobjectivesforwhichtheyweremaking policies and developinginfrastructure.

31. This is absolutely true statement. Before 1991, this was one of the important feature of economic policy. Duringthatperiod,Governmentusedtoprotectsmallscaleindustriestoavoidcompetitionfromlargescale industries.Largescaleindustrywasregulatedthroughseveralactslike MRTP Act.Ontheotherhand,small scaleindustrywasofferedprotectionfromcompetition.Forthis,certainareasofproductionwereexclusively reserved for small scale industries specially, labour intensive industries. Financial institutions were also developed to cater to the needs of small scale industries. Several boards were established to promote the productsofsuchindustriesintheglobalmarket.Theseindustriesweregettingfullspoonfeedingfromthe government.

OR

Globalisation means integrating the economy of a country with the economies of other countries under conditionsoffreeflowoftradeandcapitalacrossborders.Forinstance,acarmanufacturerbasedin Japan can manufacture auto parts in several developing countries and ship the parts to another country for assembly, then sell the finished cars to any othercountry.

Longtermtradepolicy: Therearedifferentpolicystrategiespromotingglobalisationoftheindianeconomy. Oneofthesеislongtermtradepolicy.Inconformitywitheconomicreforms,foreigntradepolicyisenforced for a longer duration which indicates it as a liberal policy. According to this policy, all restrictions and controlsonforeigntradehavebeenremovedandopencompetitionisencouragedexceptforsomespecific goods.

32. Fromthefollowingtable,itisobservedthatallthethreecountrieshaveexperiencedanoticeablestructural change as all have shifted to secondary and tertiary sector. China is relying more on secondary sector whereas India and Pakistan are relying more on tertiary sector. In case of the employment primary sector provides maximum employment opportunities in India and Pakistan and Tertairy sector in case of China. However,Chinaisshowinggreatsignofbecomingdevelopedcountriesintheworld.Expansionofservice sector in India and Pakistan is due to globalisation *i.e.* faster integration with the global economies. Thus, wecananalysefromthegiventablethatallthethreecountriesaregoingtowardsthepathofdevelopment but China has shown better performance than other twocountries.

33. **(a)** This statement is true as poverty itself is a significant cause of environmental degradation. If poverty is reduced, then automatically the problem of environmental degradation will solve to much extent.It can be explained with the help of the followingexamples:

(i) Itisduetopovertythattheruralandtribalpeopleresortstotree-fellingtogetwoodfordomestic fuel. It causes deforestation.

(ii) Slums are mushrooming across all parts of the country because of poverty only. It also causes environmental degradation by way of excessive release of domestic waste into thewaterbodies.

Thus, it is clear that poverty should be addressed before environmental degradation.

(b) It is rightly said that sustainable development should be practised daily as a routine activity. It can be achievedwhenthereischeckonenvironmentalpollutionandenvironmentaldegradation.Wecanstop littering on roads and public places, we can maintain our vehicles to minimise the smoke emitted by vehicles. We can use public transport. All such activities will help in reducing pollution. Likewise, we canrecyclethewasteornottoconstructourhousesinunauthorisedareas.Thesewillhelpinminimising environmental degradation.

OR

(a) Femaleworkersintheruralareasareunwillingtomigrateforoutsidejobs.Theyprefertoworkattheir place of home even for a low wage. However, they must work to supplement their family income for ameaningfulsubsistence.Duetothishighpercentageoffemaleworkforceinruralareasisengagedin primarysector.

(b) From the above table, it is clear that percentage of workforce engaged in primary sector has reduced from 72.72% to 43.8%. In secondary sector, it has increased from 10.02% to 24.7%. Likewise,workforce has increased from 17.26% to 31.5% in tertiary sector. However, the shift from primary to secondary and tertiary sector is noticeable but not significant. The Indian economy is still known as agricultural economy.

34. **(a)** False, There is low productivity and low reward for work which leads to widespread poverty in rural areas. Nearly 50% of workforce is employed in rural area but it is contributing less than 20% toGDP.

(b) False, Workforce refers to number of person actually working or willing towork.

(c) True,Thefarmersareforcedtoselltheirproduceimmediatelyafterharvestingduetolackofwarehousing facility. It creates the situation of excess supply in the market due to which crop price falls and consequently there is a loss of revenue to thefarmers.

ENGLISH (CODE 301)

GRADE 12

ANSWER KEY

READING

1.1. (a) (i) all the languages
(b) (iv) all of above
(c) (iii) 4, 1,2, 3
(d) (i) the language has been created since 1979.
(e) (iii) image 3
(f) (i) atlantic slavetrade
(g) (iii) grammar is common to all languages.
(h) (ii) evolution of some of the most recent languages
(i) (ii) complex grammar systems which emerge from pidgins
(j) (iv) complex
(k) (ii) 1 and 3

(1X10=10)

2.1. (a) (i) cancer
(b) (i) 2 and 4
(c) (i) gasification
(d) (i) option 1
(e) (iv) 100%
(f) (ii) 2 and 3
(g) (ii) manure
(h) (iv) 25 megawatts
(i) (ii) 25%
(j) (ii) garbage
(k) (iv) 3, 1, 4, 2

(1X10=10)

LITERATURE

3.1 (a) iv
(b) iii
© iv
(d) i

3.2 (a) i
(b) iv
© iii
(d) ii

3.3 (a) iii
(b) iv
© iii
(d) i

4.1 (a) iii
(b) ii
© iv
(d) ii

4.2 (a) iv
(b) iii
© ii
(d) iii

5 (a) iii
(b) iii
© iii
(d) iv
(e) iii
(f) ii
(g) i
(h) i
(i) ii
(j) iii

WRITING

6. FORMAT 1 MARK
CONTENT 1 MARK
EXPRESSION 1 MARK

7. FORMAT 1 MARK
CONTENT 1 MARK
EXPRESSION 1 MARK

8. FORMAT 1 MARK
CONTENT 2 MARKS
EXPRESSION 2 MARK S

9. FORMAT 1 MARK
CONTENT 2 MARKS
EXPRESSION 2 MARKS

10. FORMAT 1 MARK
CONTENT 2 MARKS
EXPRESSION 2 MARKS

10. **(i)** Poet Neruda desires to have total inactivity. He rejects the pointless rush and hurry, the noise of machines that has bothered and disturbed us. He promotes the idea of world peace, that when everything is at rest, it will be an exotic moment.

(ii) The metaphor of the rattrap signifies that the whole world is a big rattrap which sets baits for the people. Whenever someone is tempted to touch this bait in the form of luxuries, he is caught in a dangerous trap.

(iii) When the poet looks at her mother at the airport before boarding the flight, she feels the familiar pain which she had earlier of losing her mother. As her mother is old and pale and her health is deteriorating, the poet feels that she might not be able to see her mother again.

(iv) The villagers were sitting at the back benches in M. Hamel's classroom as it was their way of showing respect to their master for his forty years of honest services. Moreover they realised the value of their native language and were guilty of disregarding their lessons.

(v) The writer says that 'little has moved with time in Firozabad' because the bangle making industry has not changed at all over the period of time. Where the world has made so much progress, Firozabad has not observed any sign of change. The illegal child labourers are still working in glass furnaces with high temperature as they used to do years ago.

(vi) Aunt Jennifer is living under the restraints of married life. She is panicky, fearful and frightened of her married life. She is a victim of gender domination at the hands of her husband. Her husband's authoritative attitude makes her so nervous that her fingers flutter while weaving.

11. **(i)** When Charley visited Sam and told about the third level, Sam initially called it a waking dream wish fulfillment. But because Sam was also insecure and wanted to be in a world free from fears and conflicts, he slowly began to believe in the existence of the third level. He wished that Charley was right. This can be inferred from the letter which he wrote.

(ii) The Governor of the prison was an extra cautious person. He was intelligently able to locate the hotel where Evans had been hiding. It was only due to his over confidence that Evans escaped otherwise he had no chance of escaping. That's why it was important that Evans should remain in disguise till the very last moment.

(iii) The General told Sadao that he would send his personal assassins to kill the soldier but he didn't do that for his self- interest. On the other hand, Dr. Sadao remembered that "I have been trained not to let a man die if I can help him". Therefore he rose above narrow prejudices of race and country and thought of saving Tom's life. Dr. Sadao was overpowered by the human goodness.

12. **(A)** We all have to face tough challenges in our life out of which many are unexpected and many are difficult to overcome but we must also learn to conquer those challenges with inner-strength, effective coping skills and support. The story 'Deep Water' gives such message in which a boy named Douglas

tries hard to face the challenge and wins in the end.

Douglas had developed a kind of repugnance towards water because of the misadventure that happened with him twice. To overcome his fear, he took the help of a swimming instructor. He took rigorous training of six months before he gained full confidence to go under water.

Douglas still felt terror-stricken when he was alone in the pool. The fragments of the old shock were still alive in his memory. But then he thought that he would reproach it and go for another length of the pool. When he was not still satisfied, he went to Lake Wentworth in New Hampshire, dived off a dock at Triggs Island and swam two miles across the lake to Stamp Act Island. He had his residual doubts. So, he went to Conrad Meadows to Meade Glacier, dived into Warm Lake and swam across to the other shore and back. Thus, he made sure that all the terror had left.

He drew a deeper meaning from this experience. Those who have known stark terror and conquered it can appreciate. There is terror only in the fear of death. He had experienced both the sensation of dying and the terror that fear of it can produce. So, the will to live somehow grew intensely. He felt relieved; free to walk the mountain paths, climb the peaks and brush aside fear.

OR

(B) Loneliness is a disagreeable emotional response to apparent isolation. Loneliness is also described as social pain—a psychological mechanism which persuades individuals to look for social connections. It is often associated with an unwanted lack of association and familiarity.

In 'The Rattrap', the peddler is devoid of love, friends and family in his life. And all this is due to his poverty. He wanders lonely on the roads selling rattraps and begging for food or shelter. Sometimes he has to steal for surviving. People's behaviour towards him is unkind and therefore he develops a negative attitude to them and thinks ill of others. He has a very pessimistic perspective and wants to succumb alone than trust anyone. He believes that everyone is greedy and blinded by the pursuit. He cannot build any kind of friendships. He prefers to lead a monotonous life until he meets Edla Williamson. She treats him with kindness and her benevolent act helps him realise that there is also good in this world. She tells him to be optimistic. This reveals that one must spend time together with other people instead of depriving themselves from social attachments.

13. **(A)** Derry was suffering from a severe sense of self-hatred and elimination because of his burnt face. He thought that he was very ugly and that's why no one would ever love him. He always remained suspicious of others' intentions. When Mr. Lamb heard about it, he felt very sad. He was disheartened to know that a fourteen year old boy was giving up on life just because of his physical disability. Mr. Lamb tried to befriend him but Derry showed no interest.

At first he shocked Derry with his strange talk. He tried to arouse Derry's interest in everything created by God. He persuaded him that he could get better than others. His encouraging words had charmed Derry. Mr. Lamb explained him that everyone and everything is essentially the same and the notion of beauty is relative. Mr. Lamb's ideas left a great impact on him and Derry began to see the world with a new perspective. Thus we can see that there developed an invisible kind of friendship between them which was not bound by age.

OR

(B) Going through the story and understanding the viewpoints of both the parent and the child, I would support the Mommy as the adults are mature enough and have the capacity to foresee the good or bad of their children. Moreover they have their expectations too from their children according to which they always desire the best for them.

In the story, we see that Roger Skunk's mummy got angry with him because she did not like her son smelling of roses. Roger was a skunk and so he must smell like a skunk only. She was not bothered how the other animals kept away from him because he smelled foul. She decided to take him back to that 'awful' wizard so that he could get back his old smell. A child's perspective is different from an adult's perspective. A child can think mother wicked and cruel and may be infuriated at her for making Roger smell bad again. But the adults are experienced and have a practical approach. Their reactions are instructed and their actions replicate their thoughts whereas the children are impulsive. Here the wizard must have taken the permission of Mommy before converting Roger into a good smelling skunk as little Roger didn't have that intelligence. In fact, the wizard had interfered with nature by using his magical powers and so he deserved to be punished by Mommy Skunk.

English QP 2

KOCHI METRO SAHODAYA
AISSCE MODEL EXAMINATION (2020-2021)
MARKING SCHEME
ENGLISH

CLASS: XII MARKS : 80

	SUGGESTED VALUE POINTS	2020
	SECTION A: READING SKILLS	
1	**COMPREHENSION PASSAGE** **NOTE: No mark(s) should be deducted for mistakes in usage and grammar, spelling, or word limit. Full marks may be awarded if a student has been able to identify the core ideas. If a student literally lifts a portion of the given passage as an answer to a question, no mark(s) to be deducted for this as long as it is relevant.**	**10 marks**
1.1	**MCQ (Any TEN)**	
	(a) (iii) foresight (b) (i) the youth that will take us to the third millennium (c) (ii) 3 and 4 (d) (i) man and man (e) (iii) first and second (f) (iii) identification of the cosmos (g) (iii) option 3 (h) (i) engage in political opposition (i) (ii) four (j) (iii) vital (k) (iv) 1 and 4	
2	COMPREHENSION PASSAGE	
2.1	**MCQ (Any TEN)**	**10 Marks**
	(a) (iii)147 **(b)** (iv) 1 and 4 **(c)**(i) nearly 72,000 **(d)** (iii) 3, 4, 2, 1 **(e)**(i) option 1 **(f)** (iii) 95,736 crore **(g)** (iv) all of these **(h)** (iv) 2017-18 to 2019-20 **(i)** (ii) Chennai and Patna **(j)** (iii) instance	

	(k) (iii) 3 and 4	
3	**LITERATURE**	8 X 1 = 8 Marks
	Extract any two	
3.1	**(a)** (iv) none of these **(b)** (iv) all of these **(c)** (iv) benevolent **(d)** (iv) since the time of their ancestors	
3.2	**(a)** (i) French **(b)** (i) metaphor **(c)** (iii) guard their language **(d)** (ii) if they do not leave theirlanguage	
3.3	**(a)** (iii) soldier **(b)** (iv) expert **(c)** (iii) it was a gun shot **(d)** (i) few daysold	
4	**Extract (any one}**	**4 x 1 = 4**
	(a) (iii) it will be a moment of tranquility **(b)** (ii) as we all will be enveloped in quietness (c) (ii) alliteration (d) (ii) feeling of oneness with their fellow human beings	
	(a) (iii) foggy slums & slums as big as doom (b) (iii) deprived (c) (ii) simile (d) (iv) all of these	
5	**ANSWER THE FOLLOWING (Any eight)**	8 x 1 = 8
	(a) (iv) for giving students a holiday at times (b) (i) he had no money to pay fees (c) (iii) to think of people whom he knew caught in the dangerous snare **(b)** (iv) Lieutenant-General had decided to drop the case against him. **(c)** (iii) to test whether he had overcome the fear of water **(d)** (iv) all of these **(e)** (iv) all of these **(f)** (i) he wanted to see Derry happy and confident **(g)** (ii) Galesburg had big old frame houses, and huge lawns **(h)** (iv) all of these	

	WRITING SKILLS **NOTE: The objective of the section on Writing Skills is to test a candidate's writing ability. Hence, expression assumes as much importance as the content of the answer.**	
1	**NOTICE**	**3 marks**
	Format- The format should include: ISSUING AUTHORITY / NAME OF THE INSTITUTION, the word 'NOTICE', HEADING, DATE, and WRITER'S NAME WITH DESIGNATION The candidate should not be penalized if he / she has used capital letters for writing a notice within or without a box.	**1 mark**
	Content	**1 mark**
	Expression	**1 mark**
	OR	
	ADVERTISEMENT	**3 marks**
	Format	**1 mark**
	Content	**1 mark**
	Expression	**1 mark**
2	**INVITATION**	**3 marks**
	Format	**1 mark**
	Content	**1 mark**
	Expression	**1 mark**
3	**Letter Writing**	**5 Marks**
	Note: - No marks are to be awarded if only the format is given. **Credit should be given for the candidate's creativity in presentation of ideas.** **Use of both the traditional and the new format is permitted.** **Mixing of the formats is not permitted.**	
	Format 1. sender's address 2. date 3. receiver's address 4. subject /heading 5. salutation closing	**1 mark**
	Content	**2 mark**
	Expression grammatical accuracy, appropriate words and spelling 1 mark coherence and relevance of ideas and style 1 mark	**2 mark**
4	**ARTICLE**	**5 marks**
	Format (Title and Writer's Name)	**1 mark**
	Content	**2 marks**
	Expression grammatical accuracy, appropriate words and spelling [1 marks] coherence and relevance of ideas and style [1 marks]	**2 marks**

	OR	
	REPORT	**5 marks**
	Format – Title & By line (writer's name)	**1 mark**
	Content	**2 marks**
	Expression grammatical accuracy, appropriate words and spelling [1 marks] coherence and relevance of ideas and style [1 marks]	**2 marks**
	LITERATURE	
5	**Answer the following (any five)**	**5 x 2 = 10**
	(a) Franz was not scolded that day because the scenario in the school had changed. M. Hamel spoke kindly to him and asked him to go to his seat. He said that Franz would feel bad when he would come to know that they won't be able to speak or write their own language from now onwards. **(b)** The crofter was so talkative and friendly with peddler because he needed a company and wanted to share his feelings with somebody. The peddler had sufficient time and he had to pass the night so he listened to him peacefully. **(c)** Douglas was not sure whether his old terror had left him or not, therefore he went to lake Wentworth. There he dived in and swam two miles across the lake using all strokes. **(d)** According to Keats, the things that cause pain and suffering are despondency, dearth of noble nature, gloomy days and unhealthy and darkened ways of human beings. **(e)** Aunt Jennifer's tigers are brave, fearless and chivalric. They live in the green forests freely and gracefully and are known for their strength, boldness and power. **(f)** The poet started looking out of the window of the car because she wanted to drive away the pain and agony she was experiencing by looking at her aged mother. She looked outside at the world which was full of life and activity. She saw young trees running past her and merry children sprinting out of their homes to play.	
6	**Answer the following (any two)**	**2 x 2 = 4**
	(a) Jack insisted that it was the wizard who was hit and not the mother as he wanted to send out a message that parents are the most genuine well-wishers of a child and their decisions are final. He did not want to give the child the freedom to go against his mother, which he knew would become a wrong example. **(b)** Mr. Lamb had a garden in which there were trees and plants of apples, pears, weeds and flowers. He used to sit in his garden and talk to those who came into his garden. He used to make toffees with honey. **(c)** There are some inferences from Sam's letter. The introductory part of the letter confirms Charley's belief in the existence of the third level. It also suggests that those who find the third level can travel across to Galesburg and enjoy the festivities, songs, music and peaceful world of the 1890s. So the author uses Sam's letter as a unique combination of the real and fantasy world.	
7	**Answer the following (any one)**	**5 marks**
	Having robbed his generous host, the peddler felt quite contented with his smartness. He did not feel any fears of conscience that he had battered the confidence lounged in him by the crofter. The selfish rogue thought only of his own safety. He realized the danger of being caught by the police with the stolen thirty kronor on his person. Hence, he decided to discontinue walking on the public highway and turn off the road, into the woods. During the first few hours the woods caused him no difficulty. Later on, it became worse as it was a big and confusing forest. The paths twisted back and forth. He kept on walking but did not come to the end of the wood. He realised that he had only been walking around in the same part of the forest. The forest with its thickets and fallen logs closed in upon him like an impenetrate prison from which he could never escape. The reaction of the peddler highlights the dilemma of human nature. Temptations lead to evil. The fruits of evil seem pleasant at first, but they deprive	

	man of his goodness and push him into the maze of the world which holds a vice-like grip on him.	
	OR	
	Douglas had experienced both the sensation of dying and the terror that the fear of death can cause. Strong will, hard resolution, courage, lot of efforts as well as honest labour conquered all his frights and fears. The firm determination to learn swimming and spirit to survive pushed aside all his fears. In reality all our fears are only psychological and can be easily won over, if we have the power to control our mind. This realisation made Douglas decide to learn swimming by engaging an instructor. This instructor, piece by piece, built Douglas into a swimmer. However, his first step was to drive away Douglas' fear of water, before training him in swimming techniques. When Douglas tried and swam the length of the pool up and down, tiny vestiges of his old terror of water would return. So, he went to Lake Wentworth, dived at Triggs Island and swam two miles across the lake to Stamp Act Island. Finally, he was certain that he had conquered his fear of water.	
	Answer the following (any one)	**5 marks**
	The third level was nothing but an invention of Charley's own mind. The life is full of insecurity, fear, war, worries and stress. Life becomes unhappy and unpleasant due to these harsh realities of life which make the life difficult. We try to overcome them through day dreams and wishful thinking. Therefore Charley wanted to escape and get a temporary refuge from the reality. It was his wishful world and he talked about this to his psychiatrist friend. This was the third level at the Grand Central Station. His friend called it his waking wish fulfilment. Charley wanted to escape to this world of romance and fancy where he found himself into the world of 1894 with wooden gates, big old frame houses, huge lungs and tremendous trees.	
	OR	
	Jo was Jack's four year old daughter who loved to listen to the stories which Jack himself created. Each story that Jack narrated to her was a slight variation of a basic tale. She would enjoy such stories and reveal her keen interest by asking many questions related to them. One day's story was about Roger Skunk, a new animal who smelled so bad that the other little creatures never played with him due to this. When Roger Skunk told his tale to the wise owl, he advised him to go to the wizard. The wizard made Roger smell like roses but when Roger returned home his mother was so annoyed that she went to the wizard and hit him on the head. The wizard made Roger Skunk smell bad again. Jo did not like the end of the story. She wanted her father to change the story's end. She wanted the wizard to hit on the head of the stupid mommy and punish her for making Roger Skunk smell bad again. It was her own innocent and immature perspective	

Class XII
INFORMATICS PRACTICES (065)
SAMPLE QUESTION PAPER (2020 - 21)

Max Marks: 70 Time: 3 hrs

General Instructions:

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A has 2 sections:
   a. Section – I is short answer questions, to be answered in one word or one line.
   b. Section – II has two case studies questions. Each case study has 4 case-based subparts. An examinee is to attempt any 4 out of the 5 subparts.
4. Part - B is Descriptive Paper.
5. Part- B has three sections
   a. Section-I is short answer questions of 2 marks each in which two questions have internal options.
   b. Section-II is long answer questions of 3 marks each in which two questions have internal options.
   c. Section-III is very long answer questions of 5 marks each in which one question has question has internal option.

	PART A	
	Section - I **Attempt any 15 questions from questions 1 to 21**	
Q.No.	Questions	Mark
1	Name the attribute that returns the number of elements of a Series. a. Series.itemsize b. Series.shape **c. Series.size** d. Series.values	1
2	In a DataFrame, axis= 1 ,represents the_____ elements. a. Rows b. Plot **c. Columns** d. Graph	1
3	Which of the following is not an operating system? **a. GNU** b. Firefox c. BOSS d. Linux	1
4	Which clause is similar to “HAVING” clause in Mysql?	1

	a. SELECT **b. WHERE** c. FROM d. None of the above	
5	Small bits of data stored as text files on a browser. a. WebPage b. Web Browser c. Firewall **d. Cookies**	1
6	"COUNT" keyword belongs to which categories in Mysql? **a. Aggregate functions** b. Operators c. Clauses d. All of the mentioned	1
7	A Primary key column a. Can have NULL values b. Can have duplicate values c. Both (a) and (b) d. Neither (a) nor (b)	1
8	…….. describes the number of data points that fall within a specified range of values in histogram **bins**	1
9	Name the function that we need to save a plot with matplotlib **savefig()**	1
10	An act of stealing others Intellectual Property without their consent of without citing the source is called **Plagiarism**	1
11	Which of the following is NOT an intellectual property? a. A poem written by a poet b. An original painting made by a painter c. Trademark of a Company **d. A remixed song**	1
12	_____ method in Pandas can be used to change the index of rows and columns of a Series or Dataframe : a. rename()	1

	b. reindex() c. reframe() d. none of the above	
13	Cyber attack that uses disguised email as a weapon a. Spamming **b. Phishing** c. Hacking d. Bulling	1
14	The result of an arithmetic operation between Series of different index will result in a. Union **b. NaN** c. Will display error d. all of the Mentioned	1
15	….. is defined as discarded computers, office electronic equipment, mobile phones etc **Ewaste**	1
16	Which function is used to find most often appeared value from a set of numbers? a. mean() **b. mode()** c. median() d. count()	1
17	It is a device that connects dissimilar networks. a. Repeater b. Switch c. Firewall **d. Gateway**	1
18	Name the network device that amplifies signals transmitted on the network **Repeater**	1
19	The network device that converts digital signal to analog signal and vice versa. a. Repeater b. Switch **c. Modem** d. Gateway	1
20	We can delete an element from a series using	1

	a. empty() b. delete() c. rsub() **d. drop()**	
21	Online _____ is the theft of personal information in order to commit fraud. **Identity Theft**	1
	SECTION - II **Both the case study based questions (22 & 23) are compulsory. Attempt any four sub parts from each question. Each sub question carries 1 mark .**	
Q.No.	Questions	Mark
22	DataFrame is already created here. Write the answer for **any four** questions from (i)-(v) mentioned below. import pandas as pd data = {'name': ['James', 'Anna', 'Janet', 'Yogi', 'Robin', 'Amal', 'Mohan'], 'city': ['Mexico City', 'Toronto', 'Prague', 'Shanghai','Manchester', 'Cairo', 'Osaka'], 'age': [41, 28, 33, 34, 38, 31, 37], 'score': [88.0, 79.0, 81.0, 80.0, 68.0, 61.0, 84.0]} row_labels = [101, 102, 103, 104, 105, 106, 107] df = pd.DataFrame(data=data, index=row_labels) print(df)	
i.	Display the city of all the students. (i) print(df['city']) (ii) print(df.city) (iii) print(df.iloc[:,1]) (iv) print(df.iloc[:,0]) Choose the correct answer a. Both (i) and (ii) **b. (i),(i),and (ii)** c. Only (iv) d. All of the above	1
ii.	Display the city, age and score of all the students. (i) print(df('city','age','score'() (ii) print(df.iloc[1:4])	1

	(iii) print(df[['city','age','score']]) (iv) print(df.iloc[:,1:4]) Choose the correct statement a. Both (i) and (ii) b. Only (iii) **c. Both(iii) and (iv)** d. Only (iv)	
iii.	Display the details of the student 103 (i) print(df.loc[103,1]) (ii) print(df.loc[103]) (iii) print(df.loc[103,:]) (iv) print(df.iloc[2,:]) Choose the correct statement **a. (ii) , (iii) and (iv)** b. Only (iii) c. Both(iii) and (iv) d. Only (iv)	1
iv.	Display the details of the students 104 to 107 print(df.loc[104:107]) print(df.iloc[3:]) print(df.iloc[104:107]) print(df.loc[3:]) Choose the correct statement a. Only (iii) **b. Both (i) and (iii)** c. Both(iii) and (iv) d. Only (iv)	1
v.	Display the city in which Robin lives. (i) print(df.city[105]) (ii) prin(df.iloc['Robin']) (iii) print(df.iloc[4,1:2]) (iv) print(df.city['Robin']) Choose the correct statement a. (i),(iii),(iv) **b. Both (i) and (iii)** c. Both(ii) and (iii) d. All of the above	1

Ans:	print("Display the city of all students") print(df['city']) print(df.city) print(df.iloc[:,1]) print() print("Display the city, age and score of all the students") print(df[['city','age','score']]) print(df.iloc[:,1:4]) print() print("Display the details of the student 103") print(df.loc[103]) print(df.loc[103,:]) print(df.iloc[2,:]) print() print("Display the details of the students 104 to 107") print(df.loc[104:107]) print(df.iloc[3:]) print() print("Display the city in which Robin lives") print(df.city[105]) print(df.iloc[4,1:2])	
23	Mr. Manav, a database administrator in "Global Educational and Training Institute" has created following table named "Training" for the upcoming training schedule:	4

Training

Training_Id	Name	Email_Id	Topic	City	Fee
ND01	Mr. Rajan	raj@gmail.com	Cyber Security	New Delhi	10000
GU01	Ms. Urvashi	urv@yahoo.com	ICT in Education	Gurugram	15000
FD01	Ms. Neena	neenarediff.com	Cyber Security	Faridabad	12000
ND02	Mr. Vinay	NULL	ICT in Education	New Delhi	13000
GU02	Mr. Naveen	nav@gmail.com	Cyber Security	Gurugram	NULL

Help him in writing SQL query for the following purpose:

(i)	To count how many female candidates will be attending the training.	
(ii)	To display list of free trainings.	
(iii)	To display all the cities where Cyber Security training is scheduled along with its fee.	
(iv)	To add a column feedback with suitable data type	
(v)	Help Manav to write the command to display the name of the candidate paying minimum fee.?	
	i. Select count(name) from training where name like 'Ms.%'; ii. Select * from training where fee is NULL; iii. Select city, fee from training where topic = 'Cyber Security'; iv. Alter table training add feedback varchar(20);	
	PART – B	
	SECTION 1	
24	Ms. Anushka , recently discovered that communication between her administrative office and HR office is extremely slow and signals drop quite frequently. These offices are 125 meters away from each other and connected by an Ethernet cable. (i) Suggest her a device, which can be installed in between the offices for	2

	smooth communication. (ii) What type of network is formed by having this kind of connectivity out of LAN,MAN, and WAN?	
Ans:	(i) Reaper or Switch (ii) LAN	
25	There is a column C1 in a table T1. The following two statements: SELECT COUNT(*) FROM T1; and SELECT COUNT(C1) from T1; are giving different outputs. What may be the possible reason?	2
Ans	Count(*) gives count of all rows. Count(c1) gives count of that particular row.	
26	What is hacking? What is the difference between hacking and cracking ?	2
Ans:	Hacking is the process of gaining unauthorized access into a computing device, or group of computer systems. This is done through cracking of passwords and codes which gives access to the systems. Difference between hacker and cracker is that a cracker breaks the security of computer systems, and a hacker is a person who likes to explore computer systems and master them.	

27	Consider the given 2 series
	`>>> s`
	`1 2`
	`2 4`
	`3 6`
	`4 8`
	`dtype: int64`
	`>>> s1`
	`1 10`
	`2 20`
	`3 30`
	`5 40`
	`dtype: int64`
	Write the output after doing the mathematical operations
	`>>> s+s1` ii. . `>>> s*s1`
		2

Ans:	`>>> s+s1`
	`1 12.0`
	`2 24.0`
	`3 36.0`
	`4 NaN`
	`5 NaN`
	`dtype: float64`
	`>>> s*s1`
	`1 20.0`
	`2 80.0`
	`3 180.0`
	`4 NaN`
	`5 NaN`
	`dtype: float64`	

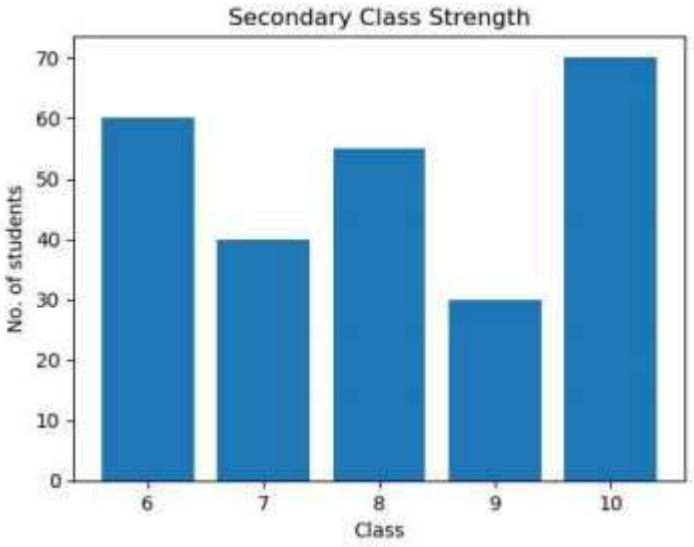
28	Consider the following Series **S** with index as **item name** and values as **item price**
	`Soap 250`
	`Handwash 400`
	`Powder 300`
	`Facewash 500`
	`Comb 100`
	`dtype: int64`
	i. Write the command to display the name of the item having price<200.
	ii. Write the command to give name to the index as 'itemname'.
		2

	S=pd.Series([250,400,300,500,100],index=['Soap','Handwash','Powder','Facewash','Comb']) print(S) print(S[S<200])	

	print() S.index.name='itemname' print(S)	
29	A college is considering networking with 75 stand-alone computers,2 printers, 1 scanner and adding a server. State 2 advantages of doing this. **OR** What is the difference between static and dynamic web pages?	2
Ans:	Resource sharing – Sharing of resources like printer, scanner and Server. Effective Communication – Communication among computers can be faster using chats, messages and other services . **OR** Static web page: A web page which displays same kind of information whenever a user visits it is known as a static web page. A static web page generally has .htm or .html as extension. Dynamic web page: An interactive web page is a dynamic web page. A dynamic web¬ page uses scripting languages to display changing content on the web page. Such a page generally has .php, .asp, or .jsp as extension.	
30	Write a program in Python Pandas to create the following DataFrame for a Competition from a **Dictionary**: Perform the following operations on the DataFrame : i. Add both the Event1 and Event2 points of participants and assign to column "Total" and display the DataFrame. ii. Display the highest point in Event1 and lowest point of Event2 and display the DataFrame.	2
Ans	import pandas as pd d1={'Chest_No':[110,240,325,101], 'Name':["Gouri","Sharma","Anupama","Krishna"],'Event1':[90,65,70,80],'Event2':[80,45,95,76]} df=pd.DataFrame(d1) print(df) df['Total Score'] = df['Event1']+ df['Event2'] print(df) print("Maximum score in Event1 and Event2: " , max(df['Event1']), min(df['Event2']))	

	Chest_No	Name	Event1	Event2
0	110	Gouri	90	80
1	240	Sharma	65	45
2	325	Anupama	70	95
3	101	Krishna	80	76

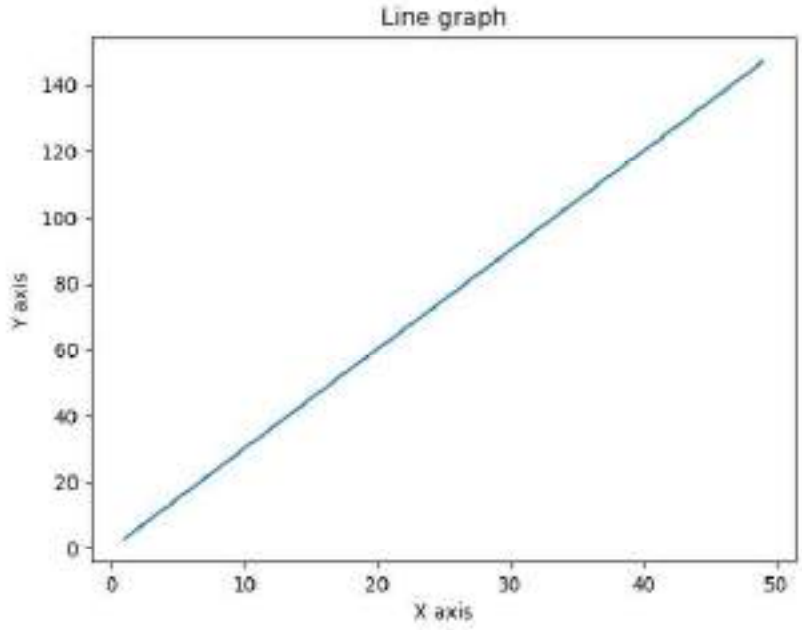
31	For the given DataFrame df, write python statements to sort the DataFrame on ascending order of points.  OR Hitesh wants to display the last four rows of the DataFrame df and has written the following code : >>df.tail() But last 5 rows are being displayed. Identify the error and rewrite the correct code so that last 4 rows get displayed.	2
Ans	#Ascending order of points import pandas as pd data={'House':['Raman','Tagore','Raman','Tagore','Ashok'],'Year':[2010,2010,2011,2011,2010],'Points':[500,600,300,400,500]} df=pd.DataFrame(data) print(df) print(df.sort_values(by=['Points'])) OR import pandas as pd d1 =pd.DataFrame([10,20,30,40,50],index=['a','b','c','d','e']) print(d1) print(d1.tail(4))	
32	Write down the difference between Shareware and Freeware. Give one example each	2
Ans:	These are available free of cost. They can be used, copied, distributed but no modification isallowed because Source Code is not available. These software are freely used, copied and distributed for a certain period of time. After expiry,you have to purchase or uninstall them. Modification is not possible due to non-availability of thesource code. These are the Demo version and freely distributed for trial purpose.	
33	Mrs. Sharma is the class teacher of Class 'VII A' She wants to create a table 'Student' to store details of her class. (i) Which of the following can be the attributes of Student table? a) RollNo b) "Amit" c) Name d) 25	2

	ii) Name the Primary key of the table 'Student'. State reason for choosing it.	
Ans	i. a) RollNo b) Name ii. Primary Key: RollNo as it will be unique for each student of the class.	
	SECTION - II	
34	What will be the output of the following code: import matplotlib.pyplot as p x=[6,7,8,9,10] y=[60,40,55,30,70] p.title('Secondary Class Strength') p.xlabel('Class') p.ylabel('No. of students') p.bar(x,y) p.show() OR Write a program to draw **line charts** for the following with suitable label in the X-axis, Y-axis and a title. Show the unemployment rate from 1930 to 2020 Year = [1930,1940,1950,1960,1970,1980,1990,2000,2010,2020] Unemployment_Rate = [9.8, 12, 8, 7.2, 6.9, 7, 6.5, 6.2, 5.5, 9.3]	3
Ans:	 **OR** import matplotlib.pyplot as plt	

```
Year = [1920,1930,1940,1950,1960,1970,1980,1990,2000,2010]
Unemployment_Rate = [9.8,12,8,7.2,6.9,7,6.5,6.2,5.5,6.3]

plt.plot(Year, Unemployment_Rate)
plt.title('Unemployment Rate Vs Year')
plt.xlabel('Year')
plt.ylabel('Unemployment Rate')
plt.show()
```

35 Write a Pyhton program to draw a line with a suitable label in the X axis and Y axis and a title. The code snippet gives the output shown in the following screenshot. 3



OR

Write a python program to draw a histogram with following information:

10	15	10	10	10	15	20	20	20	20	20	25	25

The histogram should have following information

a) X-axis label should be score and Y-axis should be Frequency

b) The title should be Frequency of Score

c) The colour of histogram should be cyan with 10 bins

Use proper import statements in the program

```
import matplotlib.pyplot as plt
import numpy as np
x=np.arange(1,50)
y=x*3
plt.plot(x,y)
```

```
plt.xlabel("X axis")
plt.ylabel("Y axis")
plt.title("Line graph")
plt.savefig("line.png")
plt.show()
```

OR

```
import numpy as np
import matplotlib.pyplot as plt

score=[10,15,10,10,10,15,20,20,20,20,20,25,25]
plt.hist(score,bins=10,facecolor='c')
plt.xlable="score"
plt.ylable="Frequency"
plt.title("Frequency of score")
plt.show()
```

36 Consider the following **TEACHER** table: 3

Write SQL commands for (i) and (ii) output for (iii).

Tid	TName	Department	Salary	Noof Periods
100	Joseph	Physics	45000	25
101	Lakshmi	Hindi	55000	25
102	Neelu	Chemistry	66000	
103	John	Physics	40000	25

(i) To display the details of Teacher table in ascending order of Salary.

(ii) To display the TNAme in ascending order of teacher's name.

(iii) SELECT avg(NoofPeriods) from Teacher;

Ans

(i) SELECT * from Teacher order by Salary asc;

(ii) Select * from TEACHER order by TName;

(iii) Avg(NoofPeriods) 25

37 On the basis of '**Student**" table below answer the questions : 3

RollNo	Name	Class	DOB	Gender	City	Marks
1	Nanda	X	06-06-1995	M	Agra	551
2	Saurabh	XII	07-05-1993	M	Mumbai	462
3	Sanal	XI	06-05-1994	F	Delhi	400
4	Trisla	XII	08-08-1995	F	Mumbai	450
5	Store	XII	08-10-1995	M	Delhi	369
6	Marisla	XI	12-12-1994	F	Dubai	250
7	Neha	X	08-12-1995	F	Moscow	377
8	Nishant	X	12-06-1995	M	Moscow	489

i) Give output of following SQL
SELECT GENDER, COUNT(*) FROM STUDENT GROUP BY GENDER;

ii) Find the Degree and Cardinality of the table.

iii) Write SQL to display different Cities available in table.

Ans

i) Gender count(*)
MALE 4
FEMALE 4
ii) Degree : 7 Cardinality : 8
iii) SELECT DISTINCT CITY FROM STUDENT;

SECTION – III

38 Write SQL (i) to (iii) and output for (iv) and (v) based on following table : 5

Table: Emp

EMPNO	ENAME	JOB	HIREDATE	SAL	COMM	DEPTNO
7566	JONES	MANAGER	02-Apr-81	2975	NULL	20
7654	MARTIN	SALESMAN	28-Sep-81	1250	1400	30
7698	BLAKE	MANAGER	01-May-81	2850	NULL	30
7782	CLARK	MANAGER	09-Jun-81	2450	NULL	10
7788	SCOTT	ANALYST	09-Dec-82	3000	NULL	20

i) To list the Employee Name who are not getting any commission(COMM).

ii) Display Name of Employee whose name start with character 'A'.

iii) To count number of Jobs available in company i.e. in EMP table.

iv) SELECT ENAME, SAL*10 FROM EMP WHERE DEPTNO=10;

v) SELECT YEAR(HIREDATE) FROM EMP WHERE DEPTNO=20 AND JOB='ANALYST'

Ans: (i) Select ename from emp where comm is null;

	(ii) Select ename from emp where ename like 'A%'; (iii) select count(distinct(job)) from emp; (iv) CLARK 24500 (v) 1982 or 82	
39	Create a DataFrame as shown below. import pandas as pd sales=pd.DataFrame({'2015':[256,452,635,965],'2016':[745,785,478,547],'2017':[452,474,725,854],'2018':[1021,958,528,425]}, index=['Qtr1','Qtr2','Qtr3','Qtr4']) print(sales) Write the code for the following questions: (i) Display the first three rows of the DataFrame. (ii) Display the sales in 2015, 2016 and 2017 in Quarters 1 and 2. (iii) Display the indices of the DataFrame. (iv) Display the column labels. (v) Add a new column 2019 with values[524,639,785,458]for all quarters OR Create a data frame with dictionary with keys as 'DATA1' and 'DATA2. Their values are [12,-55,67,78,nan,-44] and [56,-78,89,-90,nan,87] respectively. Replace all negative values with zero and all nan with 999. Display the resultant DataFrame. Remove the first row and display the new DataFrame.	5
Ans:	i. print(sales.head(3)) ii. print(sales.loc['Qtr1':'Qtr2','2015':'2017']) iii. print(sales.index) iv. print(sales.columns) v. print(df['2019']=[524,739,785,458]) OR	

```
#source code
import pandas as pd
import numpy as np

data={'Data1':[12,-55,67,78,np.NaN,-44],
    'Data2':[56,-78,89,-90,np.NaN,87]}

df=pd.DataFrame(data,index=[1,2,3,4,5,6])
print('DataFrame')
print(df)
print()

#i
print('Replacing negetive values with zero and NaN with 999')
df=df.fillna(999)
df[df<0]=0
print(df)
print()

#ii
print('Remove the first row')
print(df.drop(1,axis=0))
print()
```

40 Consider the tables given below 5

Table: Employee

No(Primary key)	Name(not null)	Salary	Zone	Age	Grade	Dept
1	Mukul	30000	West	28	A	10
2	Kritika	35000	Centre	30	A	10
3	Naveen	32000	West	40	NULL	20
4	Uday	38000	North	38	C	30
5	Nupur	32000	East	26	NULL	20
6	Moksh	37000	South	28	B	10
7	Shelly	36000	North	26	A	30

(i) Display the various department numbers from the table Employee. A department number should be displayed only once

(ii) Display the details of all the employees whose names contain 'a' as the second character.

(iii) Display the highest and the lowest salaries being paid in department 10.

(iv) Display the number of employees working in department 10.

(v) Display the average age of employees in each department only for those departments in which average age is more than 30.

Ans:	(i)	Select distinct dept from employee;	
	(ii)	Select * from employee where name like '_a%';	
	(iii)	Select max(salary),min(salary) from employee where dept=10;	
	(iv)	Select count(*) from employee where dept=10;	
	(v)	Select dept,avg(age) from employee group by dept having avg(age)>30;	

Answer Key - Mathematics - Class XII

1. Number of non-reflexive relations defined on a set with n elements $= 2^{n^2} - 2^{n(n+1)}$

$= 2^9 - 2^6 = 2^6(2^3 - 1) = 64 \times 7$

$= 448$

(or)

Let $a=1, b=\frac{2}{3}, c=\frac{1}{4}$

$|1-\frac{2}{3}| \le \frac{1}{2}$ i.e, $\frac{1}{3} \le \frac{1}{2}$, true

$|\frac{2}{3}-\frac{1}{4}| \le \frac{1}{2}$ i.e, $\frac{5}{12} \le \frac{1}{2}$ true

$|1-\frac{1}{4}| \le \frac{1}{2}$ i.e, $\frac{3}{4} \le \frac{1}{2}$, false

$\therefore$ R is not transitive

2. Order of $A' = 3\times4$, Order of $B' = 4\times5$

Order of $C' = 7\times3$

Order of $C'(A'\times B') = 7\times5$

(or)

For a matrix to be skew symmetric, $A' = -A$

$$\begin{bmatrix} 0 & -1 & x \\ 1 & 0 & -3 \\ -2 & 3 & 0 \end{bmatrix} = \begin{bmatrix} 0 & -1 & 2 \\ 1 & 0 & -3 \\ -x & 3 & 0 \end{bmatrix} \Rightarrow x = 2$$

3. $\int \frac{dx}{e^x + \frac{1}{e^x}} = \int \frac{e^x dx}{e^{2x}+1}$ Put $e^x = t$

$\int \frac{dt}{1+t^2} = \tan^{-1} t + c = \tan^{-1}(e^x) + c$

$$f(x) = \int_0^{(\theta x)} t \sin t \, dt$$

$$= \left[t(-\cos t) - \int \cos t \, dt \right]_0^x$$

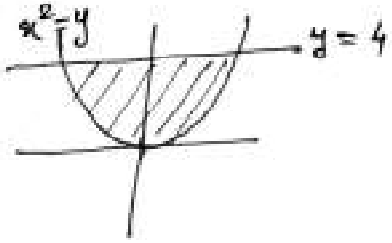
$$= \left[-t\cos t + \sin t \right]_0^x$$

$$= \sin x - x\cos x$$

$$f'(x) = \cos x - \left[x(-\sin x) + \cos x \right]$$

$$= x \sin x$$

4. $\text{Area} = 2\int_0^4 x \, dy$



$$= 2\int_0^4 \sqrt{y}\, dy = 2\left[\frac{y^{3/2}}{3/2} \right]_0^4$$

$$= \frac{4}{3} \times 8 = \frac{32}{3}$$

5. $\left[|\vec{a}||\vec{b}| \sin\theta \right]^2 + \left[|\vec{a}||\vec{b}| \cos\theta \right]^2 = 225$

$$|\vec{a}|^2 |\vec{b}|^2 \left[\sin^2\theta + \cos^2\theta \right] = 225$$

$$5^2 |\vec{b}|^2 = 225$$

$$|\vec{b}|^2 = \frac{225}{25} = 9 \qquad \therefore |\vec{b}| = 3$$

6. order = 2, degree = 1

or

$$\frac{dy}{dx} = e^{2x+y} = e^{2x} \cdot e^y$$

$$\frac{dy}{e^y} = e^{2x} dx$$

$$\int \frac{dy}{e^y} = \int e^{2x} dx$$

$$\int e^{-y} dy = \int e^{2x} dx$$

$$-e^{-y} = \frac{1}{2} e^{2x} + c$$

7. Any plane parallel to $\vec{r}\cdot(\hat{i}+\hat{j}+\hat{k}) = 2$ is

$\vec{r}\cdot(\hat{i}+\hat{j}+\hat{k}) = \lambda$ — (1)

P.v of $\vec{r} = a\hat{i}+b\hat{j}+c\hat{k}$

$\therefore (a\hat{i}+b\hat{j}+c\hat{k})\cdot(\hat{i}+\hat{j}+\hat{k}) = \lambda$

$\therefore a+b+c = \lambda$

$\therefore$ Equation is $\vec{r}\cdot(\hat{i}+\hat{j}+\hat{k}) = a+b+c$

(or)

$|\vec{a}| = 1,\ |\vec{b}| = 1,\ |\vec{a}+\vec{b}| = 1$

$|\vec{a}+\vec{b}|^2 = 1$

$(\vec{a}+\vec{b})\cdot(\vec{a}+\vec{b}) = 1$

$|\vec{a}|^2 + 2\,\vec{a}\cdot\vec{b} + |\vec{b}|^2 = 1$

$1 + 2\vec{a}\cdot\vec{b} + 1 = 1$

$2\,\vec{a}\cdot\vec{b} = -1$

$2\,|\vec{a}||\vec{b}|\cos\theta = -1$

$\cos\theta = \frac{-1}{2}$, $\theta = 120^\circ$

8. $\cos^{-1}\cos\left(2\pi - \frac{\pi}{6}\right)$

$\cos^{-1}\cos\frac{\pi}{6}$

$= \frac{\pi}{6}$; $0 \le \frac{\pi}{6} \le \pi$

9. Equivalence class is the set of lines parallel to $2y = 5x+7$, which is $2y = 5x + c$

ie, $y = \frac{5}{2}x + c$

10. $A(\text{adj}A) = \begin{bmatrix} 8 & 0 \\ 0 & 8 \end{bmatrix}$

$= 8\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$. Value of $|A| = 8$

11. $AB = 2I$

$|AB| = |2I|$

$|A||B| = 2^3|I| = 8$

$2|B| = 8 \quad , \quad |B| = 4$

12. $\vec{a}$ parallel to $\vec{b}$

$\frac{2}{6} = \frac{-1}{\lambda} = \frac{3}{9}$

$\lambda = -3$

13. $P(A) = 1 - P(\text{not } A) = 0.3$

$P(A \cap B) = P(A) \cdot P(B/A) = 0.3 \times 0.5 = 0.15$

$P(\bar{A}/\bar{B}) = \frac{P(\bar{A} \cap \bar{B})}{P(\bar{B})} = \frac{P(\overline{A \cup B})}{P(\bar{B})} = \frac{1 - P(A \cup B)}{1 - P(B)}$

$= \frac{1 - [0.3 + 0.7 - 0.15]}{1 - 0.7} = \frac{0.15}{0.3} = \frac{1}{2}$

14. $2x - y + 2z - 5 = 0 \Rightarrow a_1 = 2, b_1 = -1, c_1 = 2, d_1 = -5$

$5x - 2.5y + 5z - 20 = 0 \Rightarrow 2x - y + 2z - 8 = 0 \Rightarrow d_2 = -8$

$\therefore$ Required distance $= \left| \frac{d_1 - d_2}{\sqrt{a_1^2 + b_1^2 + c_1^2}} \right| =$

$= \left| \frac{-5 - (-8)}{\sqrt{4+1+4}} \right| = \frac{3}{3} = 1$ unit

15. $\alpha = 90^\circ \quad , \quad \beta = 135^\circ \quad , \quad \gamma = 45^\circ$

$l = \cos 90 = 0$

$m = \cos 135 = \cos(180 - 45) = -\frac{1}{\sqrt{2}}$

$n = \cos 45 = \frac{1}{\sqrt{2}}$

Direction Cosines are $0, -\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}$

16. Let A be the event of getting odd number

$A = \{1, 3, 5\}$, $P(A) = \frac{3}{6}$

Let B be the event of getting prime number

$B = \{2, 3, 5\}$, $P(B) = \frac{3}{6}$

$A \cap B = \{3, 5\}$, $P(A \cap B) = \frac{2}{6}$

$P\left(\frac{B}{A}\right) = \frac{P(A \cap B)}{P(A)} = \frac{\frac{2}{6}}{\frac{3}{6}} = \frac{2}{3}$

Section II

17 (i) b

(ii) a

(iii) b

(iv) d

v) c

18

(i) c

ii) b

iii) a

iv) 1

v) 1

Section III

19. $y = \cot^{-1}\sqrt{\frac{2\sin^2 x/2}{2\cos^2 x/2}} - \tan^{-1}\left[\frac{(\cos x/2 - \sin x/2)^2}{\cos^2 x/2 - \sin^2 x/2}\right]$

$= \cot^{-1} \tan x/2 - \tan^{-1}\left[\frac{\cos x/2 - \sin x/2}{\cos x/2 + \sin x/2}\right]$

$$y = \cot^{-1}\cot(\pi/2 - x/2) - \tan^{-1}\left[\frac{1-\tan x/2}{1+\tan x/2}\right]$$

$$= \frac{\pi}{2} - \frac{x}{2} - \tan^{-1}\tan\left(\frac{\pi}{4} - \frac{x}{2}\right)$$

$$= \frac{\pi}{2} - \frac{x}{2} - \left(\frac{\pi}{4} - \frac{x}{2}\right) = \frac{\pi}{4}$$

20. $A = \begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$ given

$|A| = 14 - 12 \neq 0$ $\quad A^{-1}$ exists.

$$\text{adj } A = \begin{bmatrix} 7 & 3 \\ 4 & 2 \end{bmatrix}$$

$$A^{-1} = \frac{1}{|A|}\text{adj } A = \frac{1}{2}\begin{bmatrix} 7 & 3 \\ 4 & 2 \end{bmatrix}$$

$$2A^{-1} = \begin{bmatrix} 7 & 3 \\ 4 & 2 \end{bmatrix}$$

$$9I - A = 9\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix} = \begin{bmatrix} 9 & 0 \\ 0 & 9 \end{bmatrix} - \begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$$

$$= \begin{bmatrix} 7 & 3 \\ 4 & 2 \end{bmatrix}$$

$\therefore 2A^{-1} = 9I - A$

(or)

$$A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$$

$|A| = -4 - 15 = -19 \neq 0$, A^{-1} exists.

$$\text{adj } A = \begin{bmatrix} -2 & -3 \\ -5 & 2 \end{bmatrix}$$

$$A^{-1} = \frac{1}{|A|}\text{adj } A = -\frac{1}{19}\begin{bmatrix} -2 & -3 \\ -5 & 2 \end{bmatrix} = \begin{bmatrix} 2/19 & 3/19 \\ 5/19 & -2/19 \end{bmatrix}$$

$A^{-1} = kA$

$$\begin{bmatrix} 2/19 & 3/19 \\ 5/19 & -2/19 \end{bmatrix} = k\begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix} = \begin{bmatrix} 2k & 3k \\ 5k & -2k \end{bmatrix}$$

$\Rightarrow 2k = 2/19 \quad \Rightarrow k = 1/19$

21. $\log x^y = \log e^{x-y}$

$y \log x = x - y$

$y = \frac{x}{1+\log x}$, $\frac{dy}{dx} = \frac{(1+\log x)\cdot 1 - x(1/x)}{(1+\log x)^2}$

$\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$

22. $f(x) = \frac{y^3+y^2-16y+20}{(y-2)^2} = \frac{(y+5)(y-2)^2}{(y-2)^2}$

LHL = RHL

$\lim_{y\to 2^-} f(x) = \lim_{y\to 2^+} f(x)$

$\lim_{y\to 2^-} (y+5) = \lim_{y\to 2^+} (y+5)$

$7 = 7 \quad \therefore k = 7$

23. $\sqrt{2}\int \frac{\sin x + \cos x}{\sqrt{2\sin x \cos x}}\,dx = \sqrt{2}\int \frac{\sin x + \cos x}{\sqrt{2\sin x\cos x + 1 - 1}}\,dx = \sqrt{2}\int \frac{\sin x + \cos x\ dx}{\sqrt{1-(\sin x - \cos x)^2}}$

Put $\sin x - \cos x = t$

$I = \sqrt{2}\int \frac{dt}{\sqrt{1-t^2}}$

$= \sqrt{2}\sin^{-1} t + c = \sqrt{2}\sin^{-1}(\sin x - \cos x) + c$

24. Area bounded by $y = 3x$, x axis and $x = 1$ and $x = 3$

$= \int_1^3 y\,dx = \int_1^3 3x\,dx = 3\left[\frac{x^2}{2}\right]_1^3$

$= 3\left[\frac{9}{2} - \frac{1}{2}\right] = 12$ Sq. units

(or)

Area between curve and line divided into 2 equal Parts

$2\int_0^a y\,dx = 2\int_a^4 y\,dx$

$$\Rightarrow \int_0^a \sqrt{x}\,dx = \int_a^4 \sqrt{x}\,dx$$

$$\Rightarrow \frac{2}{3}\left[x^{3/2}\right]_0^a = \frac{2}{3}\left[x^{3/2}\right]_a^4$$

$$\Rightarrow \frac{2}{3}a^{3/2} = \frac{16}{3} - \frac{2}{3}a^{3/2}$$

$$\frac{4}{3}a^{3/2} = \frac{16}{3}$$

$$a^{3/2} = \frac{16}{3}\times\frac{3}{4} = 4$$

$$a^3 = 4^2 \Rightarrow a = 4^{2/3}$$

25. $(1+e^{2x})dy = -(1+y^2)e^x\,dx$

$$\frac{dy}{dx} = -\frac{(1+y^2)e^x}{1+e^{2x}}$$

$$\frac{dy}{1+y^2} = -\frac{e^x}{1+e^{2x}}\,dx$$

On Integrating $\int \frac{dy}{1+y^2} = -\int \frac{e^x}{1+e^{2x}}\,dx$

$$\int \frac{dy}{1+y^2} = -\int \frac{dt}{1+t^2} \qquad \text{Put } t = e^x,\ \frac{dt}{dx} = e^x$$

$$\tan^{-1}y = -\tan^{-1}t + c$$

$$\tan^{-1}y = -\tan^{-1}(e^x) + c$$

when $y=1$, $x=0$,

$$\tan^{-1}(1) = -\tan^{-1}(e^0) + c$$

$$\tan^{-1}1 = -\tan^{-1}1 + c$$

$$2\tan^{-1}1 = c \qquad , \ 2\times\pi/4 = c\ ,\ c = \pi/2$$

∴ The Solution is $\tan^{-1}y + \tan^{-1}e^x = \pi/2$

26. Let P be the point $(1,0,0)$ and $Q(x', y' z')$ be the image
Let O be a point on the line AB (given)

$$\frac{x}{1} = \frac{y}{2} = \frac{z}{3} = \lambda$$

$$\Rightarrow x = \lambda, y = 2\lambda, z = 3\lambda$$

$\therefore$ O is $(\lambda, 2\lambda, 3\lambda)$

Direction Ratio of OP = $\lambda - 1, 2\lambda, 3\lambda$

OP $\perp$ AB

$$1(\lambda - 1) + 2(2\lambda) + 3(3\lambda) = 0$$

$$\lambda = \frac{1}{14}$$

$\therefore$ O is $\left(\frac{1}{14}, \frac{2}{14}, \frac{3}{14}\right)$

O is the midpoint of PQ

$$\frac{1}{14} = \frac{1 + x'}{2}, \quad \frac{2}{14} = \frac{0 + y'}{2}, \quad \frac{3}{14} = \frac{0 + z'}{2}$$

$$\Rightarrow x' = -6/7, \quad y' = 2/7, \quad z' = \frac{3}{7}$$

$\therefore$ Image is $\left(-6/7, 2/7, \frac{3}{7}\right)$

27. Position Vector of $A = \hat{i} + 2\hat{j} + 7\hat{k}$
Position Vector of $B = 2\hat{i} + 6\hat{j} + 3\hat{k}$
Position Vector of $C = 3\hat{i} + 10\hat{j} - \hat{k}$

$$\vec{AB} = \hat{i} + 4\hat{j} - 4\hat{k}$$
$$\vec{BC} = \hat{i} + 4\hat{j} - 4\hat{k}$$
$$\vec{AC} = 2\hat{i} + 8\hat{j} - 8\hat{k}$$
$$|\vec{AB}| = \sqrt{1 + 16 + 16} = \sqrt{33}$$
$$|\vec{BC}| = \sqrt{1 + 16 + 16} = \sqrt{33}$$
$$|\vec{AC}| = \sqrt{4 + 64 + 64} = \sqrt{132} = 2\sqrt{33}$$
$$|\vec{AB}| + |\vec{BC}| = |\vec{AC}|$$

$\therefore$ A, B, C are Collinear

28. Total number of questions = 1400

Let E denote easy question, M denote multiple choice questions

P(Selecting Multiple Choice Questions) $= P(M) = \frac{900}{1400} = \frac{9}{14}$

P(Selecting an easy multiple choice question) $= P(E \cap M) = \frac{500}{1400} = \frac{5}{14}$

$$P(E/M) = \frac{P(E \cap M)}{P(M)} = \frac{5/14}{9/14} = 5/9$$

(OR)

Let A be the event that first card is an Ace

$$P(A) = \frac{4C_1}{52C_1} = \frac{4}{52} = \frac{1}{13}$$

Let B be the event that second card is a red queen

$$P(B) = \frac{2C_1}{52C_1} = \frac{2}{52} = \frac{1}{26}$$

P(first card is an Ace and second is a red queen)

$$= \frac{1}{13} \times \frac{1}{26} = \frac{1}{338}$$

Section IV

29) $f(x) = 9x^2 + 6x - 5$

To show one - one

$9x_1^2 + 6x_1 - 5 = 9x_2^2 + 6x_2 - 5$

$\Rightarrow [9(x_1 + x_2) + 6](x_1 - x_2) = 0$.

$9(x_1 + x_2) + 6 \neq 0 \quad \Rightarrow x_1 - x_2 = 0 \quad \Rightarrow x_1 = x_2$.

To show onto.

$$x = \frac{-6 \pm \sqrt{36 + 36(5 + y)}}{18} \Rightarrow \frac{-1 \pm \sqrt{6 + y}}{3}$$

$$f(x) = 9\left[\frac{\sqrt{6+y} - 1}{3}\right]^2 + 6\left[\frac{\sqrt{6+y} - 1}{3}\right] - 5$$

Solving $f(x) = y$.

$\Rightarrow f(x)$ is one and onto.

30] $x \sin(a+y) = -\sin a \cos(a+y)$

$$x = \frac{-\sin a \cos(a+y)}{\sin(a+y)} \Rightarrow -\sin a \cot(a+y)$$

$$\Rightarrow \frac{dx}{dy} = -\sin a \operatorname{cosec}^2(a+y) \Rightarrow \frac{\sin a}{\operatorname{cosec}^2(a+y)}$$

$$\Rightarrow \frac{dx}{dy} = \frac{\sin a}{\sin^2(a+y)} \Rightarrow \frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$$

OR

$x = 2a\cos^3\theta$, $y = 3a\sin^2\theta$.

$$\frac{dx}{d\theta} = -6a\cos^2\theta \cdot \sin\theta \qquad \frac{dy}{d\theta} = 6a\sin^2\theta\cos\theta$$

$$\frac{dy}{dx} = \frac{6a\sin^2\theta\cos\theta}{-6a\cos^2\theta\sin\theta} \Rightarrow -\tan\theta$$

$$\frac{d^2y}{dx^2} = -\sec^2\theta \frac{d\theta}{dx} \Rightarrow -\sec^2\theta \cdot \frac{1}{-6a\cos^2\theta\sin\theta}$$

$$\Rightarrow \frac{1}{6a}\sec^4\theta\operatorname{cosec}\theta$$

$$\left(\frac{d^2y}{dx^2}\right)_{\theta = \pi/6} \Rightarrow \frac{1}{6a}\left(\frac{2}{\sqrt{3}}\right)^4 \cdot \frac{1}{2} = \frac{2}{9a}$$

31] $y = x^3 - 11x + 5 \Rightarrow \frac{dy}{dx} = 3x^2 - 11 \Rightarrow$ Slope of the tangent.

Slope of the tangent $y = x - 11 \Rightarrow 1$

$3x^2 - 11 = 1 \Rightarrow x = \pm 2$.

when $x = 2$, $y = -9$

when $x = -2$, $y = 19$

$(-2, -19)$ does not lie on the given tangent.

The points are $(2, -9)$

32] Surface area $S = 2\pi rh + 2\pi r^2$

$h = \left(\frac{S}{2\pi r} - r\right)$

$V = \pi r^2 h \Rightarrow \pi r^2 \left[\frac{S}{2\pi r} - r\right] \Rightarrow \frac{Sr}{2} - \pi r^3$.

$\frac{dV}{dr} = \frac{S}{2} - 3\pi r^2 \Rightarrow \frac{dV}{dr} = 0 \Rightarrow S = 6\pi r^2$.

$h = \frac{6\pi r^2}{2\pi r} - r \Rightarrow 2r \Rightarrow \underline{h = 2r}$

$\underline{\frac{d^2V}{dr^2} < 0}$. Diameter = height of the cylinder.

33] $\int \frac{x^2+1}{(x^2+4)(x^2+25)} dx$.

Let $y = x^2$.

$\frac{y+1}{(y+4)(y+25)} = \frac{A}{y+4} + \frac{B}{y+25}$

Solving $A = -7/7$ & $B = 8/7$.

$Ans = \int \left(\frac{-7/7}{x^2+4} + \frac{8/7}{x^2+25}\right) dx$.

$\Rightarrow -1/14 \tan^{-1} x/2 + 8/35 \tan^{-1} x/5 + c$.

36) OR

$\frac{2}{x} + \frac{3}{y} + \frac{10}{8} = 2$; $\frac{4}{x} + \frac{6}{y} + \frac{5}{8} = 5$; $\frac{6}{x} + \frac{9}{y} - \frac{20}{8} = -4$

$X = A^{-1}B$.

$|A| = 1200 \neq 0$

$$A^{-1} = \frac{1}{1200}\begin{bmatrix} 75 & 150 & 75 \\ 110 & -100 & 30 \\ 72 & 0 & -24 \end{bmatrix}\begin{bmatrix} 4 \\ 1 \\ 2 \end{bmatrix}$$

$$\Rightarrow \frac{1}{1200}\begin{bmatrix} 600 \\ 400 \\ 240 \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{1}{x} \\ \frac{1}{y} \\ \frac{1}{8} \end{bmatrix} = \begin{bmatrix} \frac{1}{2} \\ \frac{1}{3} \\ \frac{1}{5} \end{bmatrix} \Rightarrow \frac{1}{x} = \frac{1}{2}, \frac{1}{y} = \frac{1}{3} - \frac{1}{8} = \frac{1}{5}$$

$x = 2, \quad y = 3, \quad z = 5$

37) General point $\Rightarrow (3\lambda+2, 4\lambda-1, 2\lambda+2)$

lies on $x - y + z = 5$

Solving $\lambda = 0$ $\therefore$ The point is $(2, -1, 2)$

distance $= \sqrt{(2+1)^2 + (-1+5)^2 + (2+10)^2} = 13$.

OR

$(x + y + z - 1) + \lambda(2x + 3y + 4z - 5) = 0$

using $a_1a_2 + b_1b_2 + c_1c_2 = 0$

$\Rightarrow (1 + 2\lambda) + 1(1 + 3\lambda) + (1 + 4\lambda) = 0$.

Solving $\lambda = -\frac{1}{3}$

$\therefore$ the equation is $x - z + 2 = 0$

distance $= \left| \frac{1(0) + 0(0) + -1(0) + 2}{\sqrt{1 + 0 + 1}} \right| = \frac{2}{\sqrt{2}} = \sqrt{2}$ units.

34) $$f(y) = \begin{cases} \dfrac{y^3+y^2-16y+20}{(y-2)^2} & ; y \neq 2 \\ k & ; y = 2 \end{cases}$$

$L.H.L = R.H.L = f(2)$

$$\lim_{y \to 2^-} \frac{(y-2)^2(y+5)}{(y-2)^2} = \lim_{y \to 2^+} \frac{(y-2)^2(y+5)}{(y-2)^2} = k.$$

$\Rightarrow k = 7$

35) $$2x^2 \cdot \frac{dy}{dx} - 2xy + y^2 = 0$$

$$2x^2 \frac{dy}{dx} = 2xy - y^2$$

$$\Rightarrow \frac{dy}{dx} = \frac{2xy}{2x^2} - \frac{y^2}{2x^2}.$$

$$\Rightarrow \frac{dy}{dx} = y/x - \frac{1}{2}(y/x)^2$$

$y = vx \Rightarrow v + x\frac{dv}{dx} = v - \frac{1}{2}v^2$

$$-2\int v^{-2}dv = \int dx \Rightarrow \frac{2}{v} = \log x + C.$$

$$\Rightarrow \frac{2x}{y} = \log|x| + C$$

Section V

36) $$AB = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = I$$

$AB = I \Rightarrow B = A^{-1}$

$$\begin{bmatrix} 1 & 0 & 3 \\ -1 & 2 & -2 \\ 2 & -3 & 4 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 9 \\ 4 \\ -3 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -2 & 9 & 6 \\ 0 & 1 & 2 \\ 1 & -3 & 2 \end{bmatrix} \begin{bmatrix} 9 \\ 4 \\ -3 \end{bmatrix} = \begin{bmatrix} 0 \\ 5 \\ 3 \end{bmatrix}$$

$\Rightarrow x = 0, \quad y = 5, \quad z = 3$

38) L P P.

$360x + 120y \leq 72000 \Rightarrow 3x + y \leq 600$.

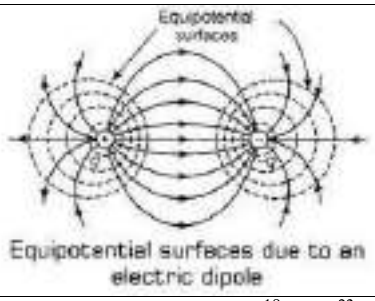
$x + y \leq 30$.

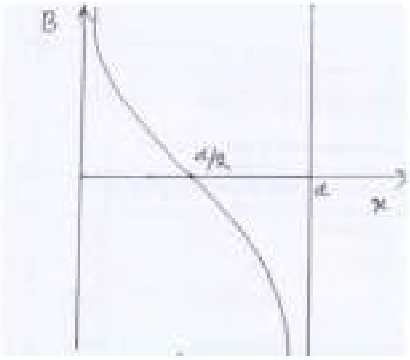
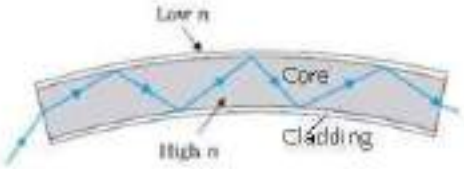
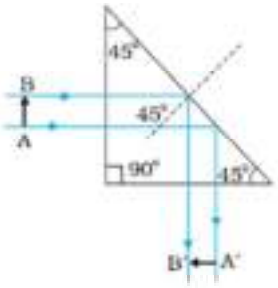
Type A = 175 units Type B = 75 units.

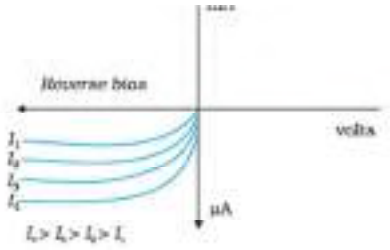
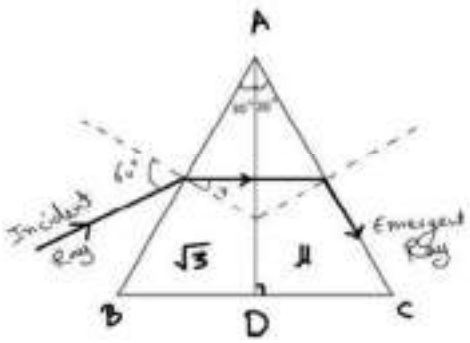
points.	OR Value
$\pm(2, 72)$	76
$(15, 20)$	50 → Minimum.
$(40, 15)$	95

The minimum Value of Z is 50 at $(40, 50)$.

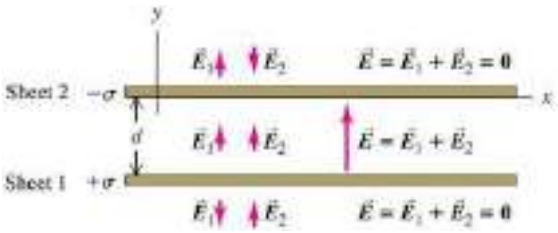
PHYSICS-MARKING SCHEME

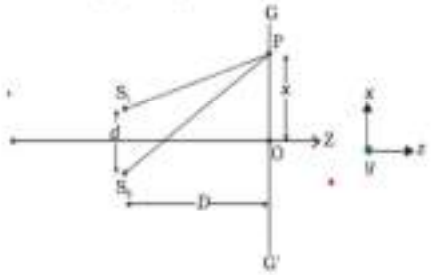
Q.No.	Value Points	Marks
1.	 Equipotential surfaces due to an electric dipole	1
2	γ-rays, Frequency range: 10^{18} to 10^{23} Hz 0R The speed in vacuum is same for all wavelengths	½ + ½ 1
3	The initial velocity is parallel or antiparallel to the magnetic field	1
4	221.9V, 314 rad/s OR The bulb glows brighter because impedance decreases	½ +1/2 ½ ½
5.	$\lambda_L < \lambda_B < \lambda_P$	1
6.	curves 1 & 2	1
7	1: 1 OR 1:2	1 1
8	(i)n-type (ii)p-type OR 1:!	½ ½ 1
9	(i)It has high optical absorption. (ii) It has suitable solar conversion efficiency	1 1
10	The reverse breakdown voltages of LEDs are very low (around 5V). Hence care should be taken that high reverse voltages do not appear across them	1
11	b	1
12	c	1
13	a	1
14	a	1
15	1.c)Copper 2.c)-5C 3.a) positive 4.b) repulsion 5. d)3Q/4 (any 4 to be attempted)	4 x 1 = 4
16	1.b) goes from a denser to rarer medium 2.c) greater than the critical angle 3.b)90^0 4.b) 2.1 x 10^8m/s 5.b) apparent depth of a water tank (any 4 to be attempted)	4 x 1 = 4

17	$B = \frac{\mu_o I}{2\pi x}$ $B_p = B_1 - B_2 = \frac{\mu_o I}{2\pi x} - \frac{\mu_o I}{2\pi(d-x)} = \frac{\mu_o I(d-2x)}{2\pi(d-x)x}$ 	1/2 1 ½ 1
18	(i) Both reflection and refraction occur due to interaction of light with the atoms at the surface of separation. As the light emitted by these charged oscillators is equal to their own frequency of oscillation, so both the reflected and refracted lights have the same frequency as the frequency of incident light. (ii) No, when light travels from one medium to another, the frequency remains unchanged. Therefore energy E = hϑ remains same OR Refer pg.no.357 of NCERT text book	1 1 2
19	Derivation of energy OR W= 2pE (derivation)	2 2
20	$E = \frac{1}{2}B\omega r^2$ = ½ 8 x 10^{-5} x 4$\prod$ x $(0.5)^2$ = 12.56 X 10^{-5}V	1 1
21	Refer pg.no. 478 of NCERT text book	2
22	 	1 1
23	$B_H = B, \quad \delta = 60$ $B_H = B_E cos\ \delta$ $B = B_E \cos 60$ $B_E = 2B$ At equator,	½ ½

	$\delta = 0$ $B_E = 2Bcos\ 0 = 2B$	½ ½
	OR $B_H = 0, \quad because\ B_v = \lvert B \rvert$ $tan\delta = \frac{B_v}{B_H} = \infty$	1
	Angle of dip $\delta = 90$ (its is possible only on magnetic north or south poles)	1
24	Photodiode Reverse Biasing  	½ ½ 1
25	 From Snell's Law $\mu = \frac{sin\ i}{sin\ r}$ i =60° , $\mu = \sqrt{3}$ $\sqrt{3} = \frac{\sin 60}{\sin r} = \frac{\sqrt{3}}{2 \sin}$ Sin r = ½ = sin 30 r= 30° So, ray will go perpendicular to AD For II[nd] prism i_c = 30° ∴ sin i_c = 1/ μ Sin 30° = 1 μ μ = 2	½ ½ ½ ½ ½ ½
26	(a)Resistor (b) Inductor For Resistor, resistance is independent of frequency; where for an inductor inductive reactance is directly proportional to frequency $X_L = 2\prod\vartheta L$ Derivation of $Z = \sqrt{R^2 + {X_L}^2}$	½ +1/2 ½ + 1/2 1

	OR	
	$X_s = 100\ \Omega$	½
	$X_L = \omega L = 2\pi \upsilon L = 2\pi \times \frac{500}{\pi} \times 100 \times 10^{-3}\Omega$	
	$= 100\ \Omega$	½
	$X_c = \frac{1}{\omega C}$	
	$Z = \sqrt{R^2 + (X_c - X_L)^2} = 141.4\Omega$	
	$P_R = I_{rms}^2 R = 225W$	1
	$P_{c=0}$	1/2
		½
27	Electric field increases $E = \frac{V}{l} = \frac{IR}{l} = \frac{I\rho l}{A}$	
	(a) l = Iρ A As area (A) decreases from end A to end B, E increases	1
	(b) current density increases; $J = \frac{I}{A}$ As area decreases, current density (J) increases	1
	(c) Mobility of electron remain same $\mu = \frac{v_d}{E} = \frac{\frac{eE\tau}{m}}{E} = \frac{eE}{\tau}$ Since 'e', 'τ' and 'm' are constant therefore (μ) is constant.	1
	OR	
	Definition	1
	Derivation of the expression $v_d = \frac{eE}{m}$	1
	Expression for resisitivity $\rho = \frac{m}{ne^2\tau}$	1
28	**Derivation of $\lambda = \frac{h}{\sqrt{2mqV}}$**	1
	$\lambda = \frac{h}{\sqrt{2mqV}}$	
	$\frac{\lambda_\alpha}{\lambda_p} = \frac{\frac{h}{\sqrt{2m_\alpha q_\alpha V}}}{\frac{h}{\sqrt{2m_p q_\alpha V}}} = \sqrt{\frac{m_p q_p}{m_\alpha q_\alpha}} = \sqrt{\frac{1.1}{4.2}} = \frac{1}{2\sqrt{2}}$	
	$\lambda_p > \lambda_\alpha$	2
29	$mvr = \frac{nh}{2\pi}$	½
	$\frac{mv^2}{r} = \frac{1}{4\pi\epsilon_0}\frac{e^2}{r^2}$	½
	$r = \frac{n^2h^2\epsilon_0}{\pi m e^2}$	½
	K $= \frac{1}{4\pi\epsilon_0}\frac{e^2}{2r}$	½

	$$U = -\frac{1}{4\pi\epsilon_0}\frac{e^2}{r}$$	½
	Total energy E = K + U $$\boldsymbol{E = -\frac{m e^4}{8n^2h^2\epsilon_0}}$$	½
30	(a)Electrons can revolve round the nucleus only in those orbits for which angular momentum is an integral multiple of h/2л where h= 6.6 x 10^{-34}Js is the Planck's constant .i.e., angular momentum is quantized .i.e., $L = \frac{nh}{2\pi}$.	1
	The circumference of the orbit should be $2\pi r = n\lambda$ From de- Broglie's equation, $\lambda = \frac{h}{p} = \frac{h}{mv}$ Therefore, $2\pi r = n\frac{h}{mv}$ $mvr = \boldsymbol{\frac{nh}{2\pi}}$ This is the quantum condition proposed by Bohr	1
	(b) $h\vartheta = E_2 - E_1$	1
31		1
	(a) Field between the points $E = \frac{\sigma}{2\epsilon_0} + \frac{\sigma}{2\epsilon_0} = \frac{\sigma}{\epsilon_0}$	1
	Field on outer side $E = \frac{\sigma}{2\epsilon_0} - \frac{\sigma}{2\epsilon_0} = 0$	1
	(b) Potential difference V= Ed = $\frac{\sigma d}{\epsilon_0} = \frac{Qd}{A\epsilon_0}$	1
	(c) Capacitance C = $\frac{Q}{V} = \frac{A\epsilon_0}{d}$	1
	OR	
	(a)Definition of flux; unit	½ +1/2
	(b)Gauss's theorem	1
	Diagram	½
	Derivation $E = \frac{\sigma}{2\epsilon_0}$; Hence electric field strength a point due to an infinite place sheet of charge is independent of the distance from it.	1½
	(c)If the sheet is positive the field is directed normally outwards /away from the sheet If the sheet is negative the field is directed normally inwards /towards the sheet	½ +½
32	Definition of eddy current	1
	Production	1
	In the transformer, large amount of energy is lost in the form of heat in its core due to the eddy currents.	1
	Eddy currents can be minimised by laminating the core of the transformer	1

	Applications of eddy current **OR** (a)Diagram Principle Working (b)Two sources of energy loss (c)When the output voltage increase, the output current decreases to keep the power same. Thus, there is no violation of conservation of energy.	½ +1/2 1 ½ 1½ ½+1/2 1
33	(a) No, because to obtain the steady interference pattern, the phase difference between the waves should remain constant with time, two independent monochromatic light sources cannot produce such light waves. (b) (b) When light waves from two coherent sources, in Young's double slit experiment, superpose at a point on the screen, they produce constructive/ destructive interference, depending on the path difference between the two waves.  Path difference between the waves reaching at point P from two sources S_1 and S_2 $S_2P - S_1P \approx \frac{xd}{D}$ For constructive interference (i.e for nth bright fringe on the screen) $\frac{xd}{D} = n\lambda$ where n= 0,±1, ±2, ... $\therefore x_n = \frac{n\lambda D}{d}$ Similarly for $(n+1)^{th}$ bright fringe $x_{n+1} = \frac{(n+1)\lambda D}{d}$ Fringe width $\beta = x_{n+1} - x_n$ $= \frac{\lambda D}{d}$ [Alternatively Path difference for n^{th} dark fringe on the screen $\frac{xd}{D} = (n + \frac{1}{2})\lambda$ (c)	1 1 1½

$$x_n = \frac{(n+\frac{1}{2})\lambda D}{d}$$

For $(n+1)^{th}$ dark fringe

$$x_{n+1} = \frac{(n+\frac{3}{2})\lambda D}{d}$$

Fringe width $\beta = x_{n+1} - x_n$

$$= \frac{\lambda D}{d}]$$

(c) The intensity at a point on the screen where waves meet with a phase difference (ϕ), is given by

$$I = 4I_0 cos^2 \phi/2$$

Phase difference (φ) when path difference is 'x'

$$\phi = \frac{2\pi}{\lambda}.x$$

$\therefore$ for $x = \lambda$, we have

$$\phi = 2\pi$$

$\therefore$ Intensity $I = 4I_0 cos^2 \pi = K$

$$\therefore \ 4I_0 = K$$

$$\therefore \ I_0 = K/4$$

Phase difference, when path difference is $\lambda/4$, is

$$\phi' = \frac{2\pi}{\lambda}.\lambda/4 = \pi/2$$

$$\therefore I' = 4I_0 cos^2 \pi/4$$

$$= 2I_0$$

$$= 2\frac{K}{4} = K/2$$

OR

$y_1 = a \cos \omega t$

$y_2 = a \cos (\omega t + \varnothing)$

According to superposition principle, the resultant displacement 1½

$y = y_1 + y_2$

$= a \cos \omega t + a \cos (\omega t + \varnothing)$

$y = 2a \cos (\varnothing/2) \ cost (\omega t + \varnothing/2)$ ----------(1)

$y = A \ cost (\omega t + \varnothing/2)$

Intensity α (amplitude)^2

$I \ \alpha \ (2a \cos (\varnothing/2))^2$

$I \ \alpha \ 4a^2 \cos^2(\varnothing/2)$ ----------(2) 1

Intensity is maximum, when $cos^2(\varnothing/2) = 1$

	$\emptyset = 2n\pi \quad (n = 0, 1, 2, \ldots\ldots)$	
	Intensity is minimum, when $\cos^2(\frac{\emptyset}{2}) = 0$	1
	$\emptyset = (2n + 1)\pi$ (n = 0, 1, 2,…….)	1
	If I_o is the intensity of the single wave, then $I_o \alpha a^2$	
	Therefore, from equation (2) $I \alpha 4I_0 \cos^2(\emptyset/2)$	1
		1

PHYSICS Answer key

1.K.Emax = hυ- W0, as work function increases, K.Emax decreases. 1

OR

Graph

2.decreases

1

3.

$$P = \frac{1}{f} = (\mu - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$\because \quad \mu_{violet} > \mu_{red}$

$\therefore$ power of the lens will be **increased** 1

4.

Since $R = R_0 A^{1/3}$

$$\Rightarrow \quad R_1 : R_2 = (1^{1/3} : 8^{1/3}) = \left(\frac{1}{8}\right)^{1/3} = \mathbf{1 : 2}$$

1

5.As fractional change in minority charge carriers is more than the fractional change in majority charge carriers, the variation in reverse saturation current is more prominent.

OR

Depletion region widens under reverse bias. 1

6.When a current-carrying coil is placed in a magnetic ***field***, it experiences torque which produces proportionate deflection. 1

7.Microwaves are generally **used in RADAR** systems due to the fact that they have longer wavelengths and low frequencies. 1

8.M=NIA

$=800x3x2.5x10^{-4}$

$=0.6J/T$ 1

9. When a changing magnetic field is linked with a coil, an emf is induced in it.. or the magnitude of the emf induced in the circuit is proportional to the rate of change of flux. 1

10. Balmer Series 1

11.d 1

12.a 1

13.c 1

14. b 1

15.Any 4

i) c

ii) b

iii) d 4

iv) c

v)b

16. Any 4

i. (b)
ii. (d) 4
iii. (d)
iv. (b)
v. (a)

SECTION B

17. By using phase difference $\varphi=2\pi\lambda$

$(\Delta)\varphi=2\pi\,(\Delta)\,\lambda$
For path difference λ, phase difference $\varphi_1=2\pi$ and for path difference $\lambda/4$, phase difference $\varphi 2=\pi/2$.

1/2

For $x = 4\lambda$, phase difference $= 2\pi$ 1/2

$\therefore I' = I_1 + I_2 + 2I_1 I_2 \cos 2\pi$
$\Rightarrow I_0=I_0+I_0+2I_0\cos 2\pi$
$\Rightarrow I_0=4I_0 \quad (\therefore \cos 2\pi = 1)$

If $I_1= I_2=I_0$ then $I'=2I_0 = 2\ I/4 = I/2$

1

18. Diagram

Working 1+1=2

19.Let the refractive index of the medium be n and speed of light in air is c.
Using Snell's law of refraction : $n_{air}\times\sin i=n_{medium}\times\sin r$ where $n_{air}=1$
$\therefore\ 1\times\sin i=n\times\sin r \quad \Longrightarrow$

Velocity of light in a medium $v=nc=sinic\times sinr$ $\Longrightarrow v\propto \sin r$ (1+1=2)
Thus velocity of light is minimum in medium A.

20. $\bar{F}$= magnetic force $=q(\bar{V}\times\bar{B})$ 1

This force **is perpendicular to the** direction **of the charge and also perpendicular to the** direction **of the** magnetic **field.** **1**

21.Angle of dip, $\delta=45^0$

$\therefore \tan\delta'= \tan\delta \ // \ \cos\theta$

$=\tan45/\cos30^0 \quad =1/\sqrt{3}/2=2/\sqrt{3}$

$\therefore$ Real dip $\delta'=\tan-1(2/\sqrt{3})$ 2

Or

Magnetic declination, or magnetic variation, is the angle on the horizontal plane between magnetic north and true north 1

Magnetic dip, dip angle, or magnetic inclination is the angle made with the horizontal by the Earth's magnetic field lines 1

22.The fringe width of interference pattern increases with the decrease in separation between S1 S2 .
1

The fringe width decrease as wavelength get reduced when interference setup is taken from air to water.

1

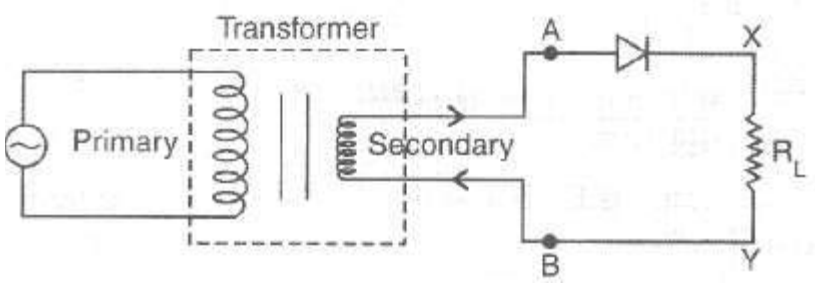
OR

$\beta= \lambda D/d$
$2.4\times10^{-4}m=6400x10^{-10}\ xD/d$
$D/d=2.4\times10^{-4}m/6400x10^{-10}$

$\beta' =1.5x10^{-4}$
$\beta- \beta' =(2.4-1.5)\ 10^{-4}$
$=0.9x10^{-4}$ m 2

23. Let an electric dipole is placed in a uniform electric field E , making an angle θ with the field ,
force on charge +q $F+q=+qE$ (along E)
force on charge −q $F-q=-qE$ (opposite to E) 1
as two equal and opposite forces are acting on the dipole therefore net force F=0
(ii) We know that work done in rotating a electric dipole from θ1 to θ2 , (where θ1 is the angle of dipole with electric field) is given by ,
$W=pE(\cos\theta1-\cos\theta2)$
now given $\theta1=0,\theta2=180$
therefore $W=pE(\cos0-\cos180)=2pE$ 1

24.Working : During one half of the input a.c., the diode is forward biased and a current flows through RL . During the other half of the input.a.c., the diode is reverse biased and no current flows through the load RL . Hence, the given a.v. input is rectified.



2

25.Self-inductance is the property of the current-carrying coil that resists or opposes the change of current flowing through it. 1

$L=E/di/dt=10x10^{-3}/2 =5x10^{-3}H$ 1

26. K.E, P.E and T.E 2

$1/\lambda= R(1/1 - 1/4)$,

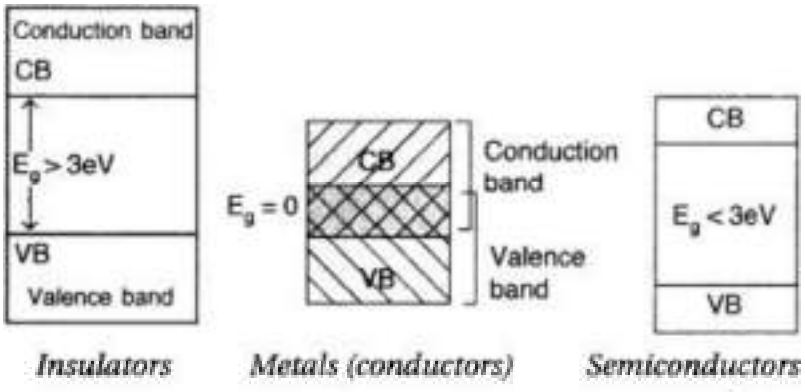
$\lambda = 1215 \times 10^{-10}$ m 1

or

Explanation 2

$R=R_0A^{1/3}$ 1

27.



2

(b) (i) When the semiconductor is doped with an acceptor impurity, thereby results in an additional energy level a little above the top of the valence band.

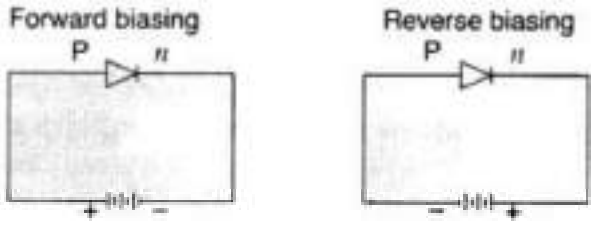
(ii) The donor impurity results in an additional energy level a little below the bottom of the conduction band.

In the first case, electrons from the valence band, easily jump over to the acceptor lelvel, leaving 'holes' behind. Hence, 'holes' becomes the majority charge carriers.

In the second case, electrons from the donor level, easily 'jump over' to the conduction band. Hence, electrons become the majority charge carriers. (1/2+1/2=1)

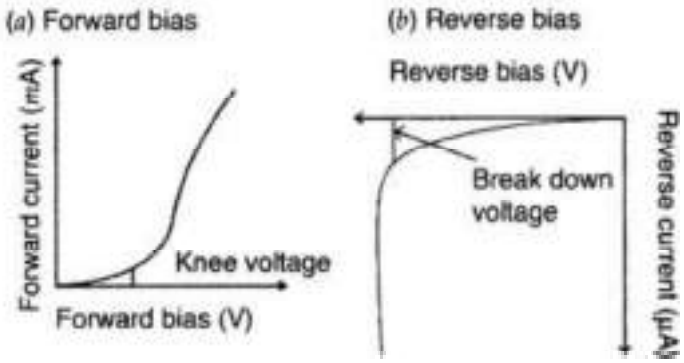
0r

(i)



2

(ii) *V-I characteristics of a p-n junction diode*



½+1/2=1

28. (a)Let a straight conductor of length l be moving in u shaped conductor in perpendicular magnetic field.
$d\phi=B(vldt)=Bvldt$
$d\phi/dt /=Bvl$
Induced emf $\varepsilon=d\phi/dt=Bvl$ 1.5

(b)Due to motion of the conductor, free electrons move from one end to other end.
Due to this, both ends generate positive and negative charge and electric force acts on it.
Now according to Lorentz law,
Fnet=Fe+Fm
At equilibrium, Fnet=0 1.5
Fe+Fm=0

$qE + q(v\times B)=0$
$E=-(v \times B)$
$|E|= B\ v \sin\theta$, when velocity perpendicular when magnetic field $\theta=90$
$|E|=Bv$
Also, $dld\xi=|E|=Bv$
$d\xi=Bvdl$
Induced emf=$Bvl=\xi$

29.(a). Work function, $\phi o=2.14eV$ 1
Frequency of light, $\nu=6\times1014Hz$

Maximum K.E. is given by the photoelectric effect.

K= hν−ϕo

K=(1.6×10−196.626×10−34×6×1014)−2.14=0.345eV

(b). For stopping potential, Vo, we can write the equation for kinetic energy as,

K= e Vo⇒Vo=e K

=1.6×10−190.345×1.6×10−19=0.345V 1

(c). The maximum speed of the emitted photoelectrons is v.
Hence, the relation for kinetic energy can be written as,
K=21mv2
m=9.1×10−31kg is the mass of electron.

⇒v2=2K/m

⇒v=3.323×105m/s=332.3km/s 1

30. (i)The balance condition for a potentiometer : $E_1/E_2=l_1/l_2$
Here E_1=1.25V, l_1=35cm, l_2=63cm and E_2=?
E2=2.25V 2

(ii)to reduce resistance 1

31.(i) Derivation 3
(ii) position of charge Q can be determined by equating the forces acting on Q due to the two charges q

K Q q/r^2=k Q q/$(2-r)^2$

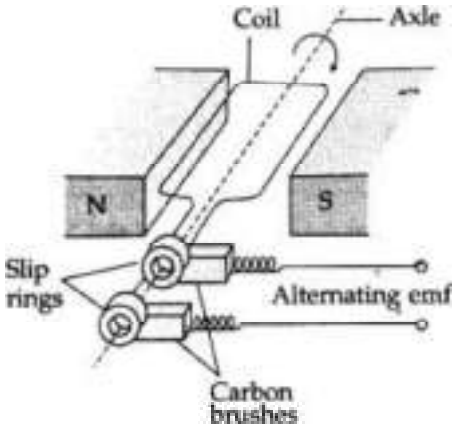
r = 1 m

for the system to remain in equilibrium equate forces on charge q due to other charge q and Q

i.e, k Q q/r^2=k q q/2^2

Q=q/4 2

32.



. 1.5

The magnetic flux linked with the coil at any instant f will be, $\phi = NAB \cos \theta = NAB \cos \omega t$

By Faraday's flux rule, the induced emf is given by,

$$E = -\frac{d\phi}{dt} = \frac{-d}{dt} NAB (\cos \omega t)$$

$$E = NAB (\sin \omega t) . \omega$$

$$\Rightarrow E = E_0 \sin \omega t \quad \text{...where } [E_0 = NAB\omega$$

When a load of resistance R is connected across the terminals, a current I flows in the external circuit. 1.5

$$I = \frac{E}{R} = \frac{E_0 \sin \omega t}{R} = I_0 \sin \omega t$$

$$\text{...where} \left[I_0 = \frac{E_0}{R} \right.$$

(c) $v = 0.5$ Hz; $N = 100$; $A = 0.1\ m^2$; $B = 0.01$ T

$$e_{max} = NAB (2\pi v)$$

$$e_{max} = 100 \times 0.01 \times 0.1 \times (2\pi \times 0.5)$$

$$\therefore \quad e_{max} = \mathbf{0.314\ volt}$$

2

Induced emf = B/V

$\therefore E = (0.3 \times 10^{-4}) \times (10) \times (5)$ volt

$E = 1.5 \times 10^{-3}$ V = 1.5 mV

OR

(a) The device X is a capacitor. 1

(b) Curve B → voltage

Curve C → current

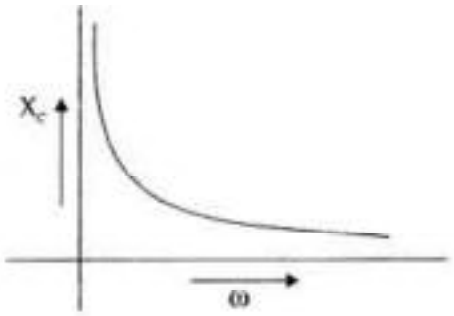
Curve A → power consumption over a full cycle.

Reason: The current leads the voltage in phase, by a plane angle of π2, for a capacitor.

1

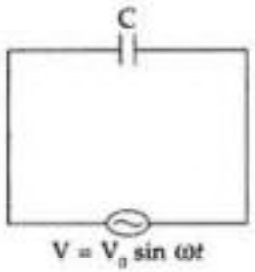
(c) $X_C = \frac{1}{\omega C} \left(X_C \propto \frac{1}{\omega} \right)$

1



(*d*) $V = V_0 \sin \omega t$

$Q = CV = CV_0 \sin \omega t$



$$I = \frac{dq}{dt} = \omega C V_0 \cos \omega t = I_0 \sin\left(\omega t + \frac{\pi}{2}\right)$$

Current leads the voltage, in phase, by π2 2

33. Statement and Explanation

3

Diagram and explanation

2

Or

Derivation

3

I min/Imax=9/25,w1/w2=?

(a−b)2/(a+b)2=9/25

∴a−b/a+b=3/5

2a=8b or a=4b

w1/w2=I1/I2=$a^2/b^2=(4b^2)/b^2=16/1$ 2