ENGLISH

A. Answer the following questions in 30 to 40 words.

1. *"That's professional etiquette."* Who says this and why?
2. What did Louisa Mebbin plant in her garden? Why?
3. Explain the lines: "And the frog with great precision counted heads and charged admission".
4. Why will the living record of memory remain?

A. Answer the question in 120 to 150 words.

The play on one side is pessimistic because it highlights the plight of old people but on the other side the play is optimistic because it gives a hope that even elderly people may chose to live merrily, despite their old age. Elaborate.

B. You are an ardent reader and want to inculcate reading habits in others. For this purpose, a good library is needed. Write a letter to the editor of the 'The Hindu' emphasizing the need to establish a public library in your town.

C. Read the passage and answer the questions that follow.

> *And immediately I regretted it.*
> *I thought how paltry, how vulgar,*
> *what a mean act,*
> *I despised myself and the voices of*
> *my accursed human education.*

(a) What did the poet regret?
(b) Find out the word from the extract which means the same as 'felt sorry or sad about a situation'.
(c) Why did the poet curse his human education?

PHYSICS

1. Two wires of equal lengths are bent in the form of two loops; one of the loops is square shaped whereas the other loop is circular. These are suspended in a uniform magnetic field and the same current is passed through them. Which loop will experience greater torque? Explain.
2. A proton and an alpha particle enter a uniform magnetic field perpendicularly with the same speed. How many times is the time period of the alpha particle than the proton? Also find the ratio of radii of the circular path of the two particles?
3. Using Gauss's law find the electric field due to uniformly charged infinite plane sheet.
4. Using Ampere's circuital law, deduce the expression for the magnetic field in the interior of a toroid carrying current.
5. Three identical cells, each of e.mf 2 V and unknown internal resistance are connected in parallel. This combination is connected to a 5 Ω resistor. If the terminal voltage across each cell is 1.5 V. What is the internal resistance of each cell?

6. (a) State the working principle of a potentiometer. With the help of a current diagram, explain how a potentiometer can be used to compare emf of two primary cells?

    (b)
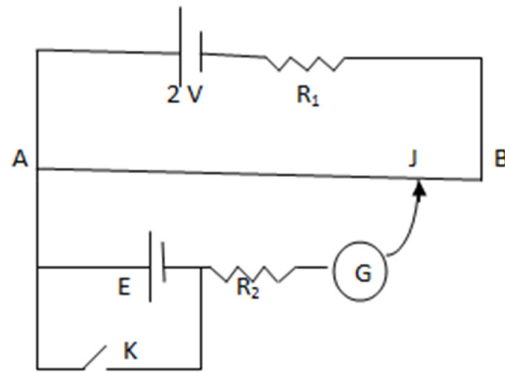
    (a) How does the position of balance point (J) change
        (i) when the resistance R_1 is decreased?
        (ii) when the resistance R_2 is increased, keeping R_1 constant?
    (b) Why cannot the balance point be obtained when the emf E is greater than 2 V?

7. State the principle of a moving coil galvanometer. Draw a labelled diagram and state the importance of radial magnetic field and how is it produced.

8   (a) Using a phasor diagram, derive the expression for the impedance of a series LCR circuit. State the condition under which the phenomenon of resonance occur in a series LCR circuit. Plot a graph showing the variation of current with the frequency of an ac source in an LCR circuit.

    (b) When an ac is connected to an ideal inductor, show that the total power supplied by the source over a complete cycle is zero.

or

A variable frequency 230 V alternating voltage source is connected across a series combination of L = 8 H, C = 50 µF and R = 60Ω. Calculate:

(a) angular frequency of the source which drives the circuit in resonance

(b) the impedance of the circuit

(c) amplitude of the current at resonance.

9. State the two conditions of total internal reflection of light to take place at an interface separating two transparent medium. Derive the relation between critical angle and refractive index of a medium.

10. A convex lens made of refractive index n_2. Parallel rays of light are incident on the lens from a medium of refractive index n_1. Trace the path of the emergent ray and state whether it will become convergent or divergent lens in each case
        (i) $n_1 > n_2$
        (ii) $n_1 = n_2$
        (iii) $n_1 < n_2$

11 Draw a graph to show variation of angle of deviation δ with that of angle of incidence i for a monochromatic ray passing through glass prism of refracting angle A and hence deduce the relation $\mu = \dfrac{\sin(A+\delta M)/2}{\sin\left(\frac{A}{2}\right)}$.

12. (a) A lamp is connected in series with an inductor and an ac source. What happen to the brightness of the lamp when an iron rod is inserted inside the inductor? Explain

    (b) A bulb and a capacitor are connected in series to an ac source of variable frequency. How will the brightness of the bulb change on increasing the frequency of the ac source? Explain.

13. Deduce the expression for potential energy of a system of two point charges q_1 and q_2 brought from infinity to the points r_1 and r_2 respectively in the presence of electric field E.

14. State Faraday's law of electromagnetic induction. 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. Derive the expression for the emf induced across the ends of the rod.

15. (a) Obtain the expression for the energy stored in an inductor L connected across a source of emf.

   (b) Define mutual induction between a pair of coils. Derive an expression for the mutual inductance of two long co-axial solenoids of same length would over one another.

CHEMISTRY

Q.1. Write the types of isomerism exhibited by the following complexes [Co(NH3)5Cl]SO4

Q.2. Complete the following chemical equation; $Cr_2O_7^{2-}(aq) + H_2S(g) + H^+(aq) \longrightarrow$

Q.3. Answer the following questions;
   (a) What are the main constituents of dettol?
   (b) How do antiseptics differ from disinfectants?

Q.4. Complete the following reaction of;
   (i) C6 H5 N2Cl + KI $\longrightarrow$
   (ii) CH3 CH2 CH = CH2 + HBr   Peroxide

Q.5. (a) Write the main structural difference between DNA & RNA.
   (b) What is meant by denaturation of proteins ?

Q.6. Give the structure of A, B and C in the following reaction;
   (i) C6 H5 N2 Cl $\xrightarrow{\text{CuCN}}$ A $\xrightarrow{\text{H2O/H+}}$ B $\xrightarrow{\text{NH3}\triangle}$ C
   (ii) C6 H5 NO2 $\xrightarrow{\text{Sn+HCl}}$ A $\xrightarrow{\text{Na NO2+Hcl}}$ B $\xrightarrow{\text{H2O/H+}}$ C

Q.7. Write the names and structures of the monomers of the following polymers;(a)Buna-S (b)Neoprene (c) Nylon-6,6.

Q.8. Account for the following ;
   (i) The boiling points of ethers are lower than isomeric alcohols .
   (ii) Ortho-nitrophenol is more acidic than ortho methoxyphenol .
   (iii) Preparation Of ethers by acid dehydration of secondary or tertiary alcohols is not a suitable method.

Q.9. (a) Give reasons (i)The enthalpies of atomization of transition elements are high.(ii)The transition metals and many of their compounds acts as good catalyst.
   (b) Explain the hybridization for the complex [NiCl4]2-

Q.10. An Organic compound A (C3 H6 O) is resistant to Oxidation but forms compound B (C3 H8 O) on reduction 'B reacts with HBr to form the compound 'C' , C with Mg forms Grignard reagent D which reacts with 'A' to form a product which on hydrolysis is E. Identify A to 'E' .

Biology

I. Answer the following.
1. Name the vegetative propagules in the following:-
   a. *Agave*   b. *Bryophyllum*
2. State one reason why breastfeeding the baby acts as a natural contraceptive for the mother?

II. Answer the following.
3. Draw the structure of human ovum and label:
   a. Corona radiate
   b. Plasma membrane
   c. Zona pellucida
4. Name two commonly used bioreactors. State the importance of using a bioreactor.

III. Answer the following.
5. a. Name the enzyme responsible for the transcription of t-RNA and the amino acid the Initiator t-RNA gets linked with.
   b. Explain the role of initiator t-RNA in the initiation of protein synthesis.

6. Describe the theories of evolution.
7. a. Explain the phenomena of multiple allelism and co-dominance taking ABO blood group as
   an example.
   b. What is the phenotype of the following:-
      i) $I^A i$ ii) ii

IV. Answer the following.
8. a. List any two advantages of GM plants.
   b. How did the process of RNAi help to control the nematode infecting the roots of tobacco plant?
9. a. Describe any two devices in flowering plants which prevent both autogamy and geitonogamy.
   b. Explain the events up to double fertilization after the pollen tube formation.

ACCOUNTANCY

Q1.   What do you understand by Accrual Basis of Accounting?
Q2.   Give two features of Trial Balance?
Q3.   Give the rules of Debit and Credit and explain them with imaginary examples?
Q4.   What are the differences between accounting and bookkeeping?
Q5.   Show the Accounting Equation for the following transactions:-
   (i)   Introduced Rs. 8,00,000 as cash and Rs. 50,000 by stock.
   (ii)   Purchased plant for Rs. 3,00,000 by paying Rs. 15,000 in cash and balance at a later date.
   (iii)   Deposited Rs. 6,00,000 into the bank.
   (iv)   Purchased office furniture for Rs. 1,00,000 and made payment by cheque.
   (v)   Purchased goods worth Rs. 80,000 for cash and for Rs. 35,000 in credit.
   (vi)   Goods amounting to Rs. 45,000 was sold for Rs. 60,000 on cash basis.
   (vii)   Goods costing to Rs. 80,000 was sold for Rs. 1,25,000 on credit.
   (viii)   Cheque issued to the supplier of goods worth Rs. 35,000.
Q6.Enter the following transactions for the month of Jan, 2018 of Girish, Delhi, into Journal, Girish started a
   business with Rs. 10,00,000, Rs. 1,00,000 in cash and balance transferred from his Savings Account.
 Jan 1.   Purchased goods in Cash for Rs. 10,000 plus CGST and SGST @ 6% each.
 Jan 2.   Machinery purchased from Mahendra Co. Rs. 1,00,000 plus CGST and SGST @ 6% each.
 Jan 3.   Purchased goods from Akash & Co. Nagpur for Rs. 2,00,000, Trade Discount 10% plus IGST @ 12%,
          issued cheque immediately and availed cash discount 2%.
 Jan 4.   Sold goods in Cash for Rs. 20,000 and charged CGST and SGST @ 6% each.
 Jan 7.   Sold goods to Rahul, Kanpur of Rs. 1,00,000, charged IGST @ 12%.
 Jan 8.   Goods returned by Rahul, Kanpur of value Rs. 30,000, being not as per specifications.
 Jan 9.   Purchased goods on credit from Ritu & Co., Jhansi for Rs. 50,000 plus IGST @ 12%.
 Jan 10. Goods costing Rs. 5,000 given as charity. These goods were purchased from Akash & Co.

Business Studies

1. Fayol points out the danger and cost of unnecessary labour turnover in one of his principles of
   management. Identify it.
2. In order to achieve target production of 5000 units per month, a Production Manager has to operate on
   double shifts. Due to power failure most of the time, the manager is able to achieve 5000 units, but at a
   higher production cost. In your point of view, what is lacking in management?
3. State the elements of Directing.
4. Differentiate between Recruitment and Selection.
5. State three advantages of External sources of recruitment.
6. Distinguish between Delegation of Authority and Decentralization on the basis of nature, freedom in
   action, status and scope.
7. Describe in brief Maslow's theory of motivation with diagram.
8. Distinguish between Formal communication and Informal communication.

Enterpreneurship

1. Distinguish between partnership and private limited company on the basis of maximum number of member.(as per latest changes)
2. Mr Ajmera, a retired CMO (Chief Medical Officer) found an old lady who fell in the park while she was doing morning walk. She had internal brain injury. Mr Ajmera could not contact her relatives since there was temporary memory loss. After 2 days of filing FIR they could trace out. Her son. Moved by this incidence Mr. Ajmera contacted some young dynamic students from medical college and told them to design an instrument which could be fitted in walking stick, bracelet or chain of senior citizens SO that members of their family could trace them when required. Identify and explain the concepts involved.
3. What is PAN ? Who issues it?
4. Explain SWOT matrix with the help of diagram
5. Colonel Verma after his retirement chalked out business plan which involved preparing candidates for clearing physical fitness test in NDA & CDS exam. For this he wanted specific time slot in Morabadi ground as well as Gymkhana club. He was given 3minutes to wind up business summary so that potential candidates as well as willing partners could contact him. What is this act of presentation known as? Explain 3 other options for start-ups to be taken by Col. Verma for his business plan.
6. Describe various elements of operation plan?
7. Explain why entrepreneurs do not prefer cooperative form of business organisation?
8. T Ltd. Company dealing in car manufacturing intends to manufacture a car with dual operating concept that is to run both by fuel and solar energy for which it would be placing solar plates at the top of car body .To manufacture this innovative energy fuel efficient car they were looking into various options and have finally narrowed it down to one option. They understand that the entire idea would have to follow a process. Identify and explain the process.

Economics

1. What is Economics? (1)
2. Define supply. (1)
3. state any two factors determining demand (1)
4. Mention the two senses in which statistics is defined. (1)
5. What is elasticity of Demand ? (1)
6. What is a pie diagram ? Give the steps in the construction of pie-diagram? (3)
7. What do you mean inclusive frequency distribution (3)
8. What is textual presentation of data ? Give the example for this . (4)
9. Distinguish between Micro and Macro economics (4)
10. Draw the histogram of daily earning of 70 workers in a factory which are given below. (6)

Daily earning-	60-70	70-80	80-90	90-100	100-110
	5	10	30	15	5

Informatics Practices

1. Following is a list of programming languages: BASIC, COBOL, C, JAVA Help Sandhya in identifying Object Oriented language(s) from the above given list.
2. Satyam is designing a frame in Netbeans containing list box. Help him in writing suitable Java statement to extract selected item from a given listbox named "jList1."
3. The following code has error(s). Rewrite the correct code underlining all the corrections made :

```
int n=5,int i=1,f=1;
do;
{ f=f*i;
i++;
while(i<=n)
jTextField1.setText(""+f);
```

4. Mrs. Sharma is the classteacher of Class 'XII 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.
5. Table "Emp" is shown below. Write commands in SQL for (i) to (iv) and output for (v) and (vi)

ID	NAME	AGE	ADDRESS	SALARY	PHONE
1	Siddharth	25	A-4, Ashok Vihar, Delhi	62000	98110766656
2	Chavi	23	B-21, Model Town, Mumbai	71000	99113423989
3	Karan	26	KC-24, North Avenue, Bhopal	65000	98105393578
4	Raunaq	22	A-152, Gomti Nagar, Lucknow	89000	99101393576
5	Kunal	27	B-5/45, Uday Park, Delhi	80000	97653455654

   i. To display list of all employees below 25 years old.
   ii. To list names and respective salaries in descending order of salary.
   iii. To count the number of employees with names starting with 'K'
   iv. To list names and addresses of those persons who have 'Delhi' in their address.
   v. SELECT Name, Salary FROM Emp where salary between 50000 and 70000;
   vi. SELECT Name, phone from emp where phone like '99%';
6. Write SQL query to create a table 'Player' with the following structure:

Field	Type	Constraint
Playerid	Integer	Primary key
name	Varchar(50)	
height	Integer	
weight	Integer	
datebirth	Date	
teamname	Varchar(50)	

7. 'Bachpan Toys' is a small company manufacturing toys. They have decided that it would be beneficial to the company to create a website which would allow customers to order toys on-line. State how 'Bachpan Toys' would benefit from the website.

8. Which of the following is/are the advantage(s) of e-Governance :
   i) technology makes governance speedier
   ii) Computer literacy and basic Internet usage is not required.
   iii) governance is made transparent, that is most of the information is available to public.

9. Lakshmi works for a school. She wishes to create controls on a form for the following functions. Choose appropriate controls from Text field, Label, Radio button, Check box, List box, Combo box, Button and write in the third column.

S. No.	Control used to	Control
1	Enter Admission number	
2	Select Stream	
3	Select Subject	
4	Clear the Form	

10. Mr. Pawan works as a programmer in "ABC Marketing Company" where he has designed a Salary generator software to generate the salary of salesman in which Name and Salary are entered by the user. A screenshot of the same is shown below:

ABC Company

Help him in writing the code to do the following:
i. After selecting appropriate Radio Button, when 'Commission' button is clicked, commission should be displayed in the respective text field as each Salesman will get a commission based on the units sold according to the following criteria:

Units Sold	Commission (in Rs)
1 to 20	500
20 to 40	1000
>40	2000

ii. When 'Gross Salary' button is clicked, Gross Salary should be calculated and displayed in the respective text field as per the given formula: Gross Salary= Salary+Commission

iii. After required selection of Checkbox(es), when 'Facility Charges' button is clicked, Facility charges will be displayed in the respective text field according to the following criteria:

Facility	Charges
Transport	500
Mess	2000

iv. Money will be deducted from the Gross Salary according to the facilities opted by the employee. When 'Net Salary' button is clicked, Net Salary should be calculated and displayed in the respective text field as per the given formulae:

          Net Salary= Gross Salary-Deductions