CHEMISTRY

1 State Henry's law correlating the pressure of a gas and its solubility in a solvent and mention two applications of the law.

2 Calculate the temperature at which a solution containing 54 g of glucose, ($C_6H_{12}O_6$) in 250 g of water will freeze. (K_f for water =1.86 K mol kg -1)

3 State Raoult's law for solutions of volatile liquids. Taking suitable examples explain the meaning of positive and negative deviations from Raoult's law.

OR

Define the term osmotic pressure. Describe how the molecular mass of a substance can be determined by a method based on measurement of osmotic pressure?

4 Define osmotic pressure. How is it that measurement of osmotic pressures is more widely used for determining molar masses of macromolecules than the rise in boiling point or fall in freezing point of their solutions?   **OR**

Derive an equation to express that relative lowering of vapour pressure for a solution is equal to the mole fraction of the solute in it when the solvent alone is volatile.

5 Differentiate between molality and molarity of a solution. What is the effect of change in temperature of a solution on its molality and molarity?

6 (a) Define the following terms: (i) Mole fraction(ii) Van't Hoff factor

(b) 100 mg of a protein is dissolved in enough water to make 100 mL of a solution. If this solution has an osmotic pressure 13.3 mm Hg at 25° C, what is the molar mass of protein? (R = 0.0821 L atm mol–1 K–1 and 760 mm Hg = 1 atm.)

OR

What is meant by: (i) Colligative properties (ii) Molality of a solution.

(b) What concentration of nitrogen should be present in a glass of water at room temperature? Assume a temperature of 25° C, total pressure of 1 atmosphere and mole fraction of nitrogen in air of 0.78. [KH for nitrogen = 8.42 × 10–7 M/mm Hg]

7 Calculate the freezing point depression for 0.0711 m aqueous solution of sodium sulphate(Na2 SO4), if it is completely ionised in solution. If this solution actually freezes at – 0.320 °C, what is the value of Van't Hoff factor for it at the freezing point? (Kf for water is 1.86°C mol–1)

8 What is 'reverse osmosis'?

9 Non-ideal solutions exhibit either positive or negative deviations from Raoult's law. What are these deviations and why are they caused? Explain with one example for each type.

Express the relation among the conductivity of solution in the cell, the cell constant and the resistance of solution in the cell.

(a) What type of a battery is lead storage battery? Write the anode and cathode reactions and the overall cell reaction occurring in the operation of a lead storage battery.

Write the anode and cathode reactions occurring in a commonly used mercury cell. How is the overall reaction represented?

BIOLOGY

1. Complete notes of chapter 11,12,13 in your fair copies.

 2. Attempt ncert questions and previous year questions of board in fair copies.

 3. Make a neat and clean file on any suitable topic from your book.

 4. Read chapter 4,5 and highlight important points.

 5. Prepare a chart paper on any topic from your NCERT book.

MATHEMATICS

1. Make mind maps of ch-1,2 and solve 15 questions of each chapter covering all the topics of Ch-1,2

2. Make a chart on all the identities of Ch-2 including Domain and range table of inverse trigonometric functions.

ENGLISH

1. You visited PGIMS Rohtak and found that there was a shortage of blood for accidental cases. After that, you decided to organize a blood donation camp on your school's campus to help the needy at PGIMS Rohtak. Therefore, as a principal of G.S.S.S. Model Town, Rohtak, you decided to organize a blood donation camp at the school auditorium on August 15 at 10 a.m. on the occasion of Independence Day to help the needy. Write a notice for the newspaper column asking as many people as possible to come to the blood drive.

2. Winter has arrived, and students are experiencing severe cold and fog. Therefore, as a principal, you have decided to change the school schedule. As principal of Sardar Patel Vidyalaya, Delhi, draught a notice of no more than 50 words informing students of the change in school timings with effect from the 1st of December. State the valid reasons for the change.

3. You are John, the President of the school book club. The club is organising a drive for promoting reuse of study materials and books. Draft a notice in about 50 words, for the school notice board, addressing students , informing them about this drive and urging them to contribute to the endeavour. Mention how the donated books would benefit a charitable cause.

4. You are Secretary of the History Club of Vidya Mandir School. Draft a notice in not more than 50 words informing students of a proposed visit to some important historical sites in your city.

5. You are Aman/Aarti of 119, Church Road, Kanpur. You are interested in doing a short term course in Public Speaking for your personality enrichment during your summer vacation. Write a letter to the Director, Personal Centre, Sector 22, Chandigarh, inquiring about the duration of such a course and the terms and conditions for admission

6. You are Akhil /Karishma of 119, Mall Road, Shimla. You are interested in doing a short-term course in computer programming during your summer vacation. Write a letter to the Director Computer World, Sector 22, Chandigarh, inquiring about the duration of such a course and the terms and conditions for admission.

7. Bal Vidya Public School, Bhilai, urgently requires a post-graduate teacher to teach political science for which they have placed an advertisement in The Bhilai Express. You are Sanjay/Sanjana Sharma from 21, Vasant Marg, Bhilai. Draft a letter including a CV, applying for the advertised post.

8. Write an invitation in not more than 50 words to your friend Rameshwari to spend her winter break with you in Mumbai. You are Puja/Puneet of 25, M.G. Road, Mumbai.

9. You are Dr Avinash Bhalla. You have received an invitation from the Director, Health Services, Haryana who has invited leading medical practitioners of the state to attend a workshop on 'child care' on 20 May, 20XX at 10 a.m. in Civil Hospital Ambala. Respond to the invitation.

10. Last week as you were coming back from school you happened to see a huge plastic bag full of leftovers of food being flung into the middle of the road from a speeding car. You wondered how people can be

so devoid of civic sense. Write an article in 125-150 words on why we lack civic sense and how civic sense can be inculcated in children at a very young age. You are Shiva/Shamini.

11. Write an article in 200 words on 'The Role of Youth in National Development' to be published in your school magazine. You are Mumtaz/Mohd. Azam of XII Std., Bharathiya Vidya Bhavan, Delhi.

12. You are Aman/Ananya. 'Equal Pay for Equal Play' is the new slogan in the sports sector after BCCI's (Board of Control for Cricket in India) recent historic announcement of removing pay disparity between the men's and women's cricket teams. Write an article in 120–150 words for the New India magazine, evaluating the impact of such an announcement for the nation. You may use the cues given below along with your own ideas.

- Impact on cricket
- Impact on other sports
- Impact on society
- Impact on the female gender

13. Animals rights organizations have often condemned the use of animals on movie sets. According to media reports, there have been instances of animals being injured or killed as a result of exhaustion or worm infestation while on set. In about 120–150 words, draft an article for the opinion column of a national newspaper on the theme of animal mistreatment and how the cinema industry can address the issue with concrete.

14. With advent of the internet, our attention span has reduced considerably. According to some studies, the average attention span has reduced from 12 seconds to 8 seconds, which is lower than a goldfish's attention span of 9 seconds. Some researchers believe that this is a natural evolution of the human brain to live in the information-technology age.

Draft an article in 120–150 words for the opinion section of an e-magazine exploring the change in attention span and its effects, and noting suggestions for cultivating a more focused mind. You can use the following cues to build on your article.

♦ We deal with multiple sources of information nowadays (virtual conversations/face-to-face interactions/social media posts/books and newspapers)

♦ We are distracted easily (smartphones/laptops/tv accessible at almost all times)

♦ Meditation (focused breathing exercises) for at least 10 minutes daily significantly improves memory and focus.

♦ Reducing screen time also helps (and can be used consciously during our break times)

15. MMD School, Nashik, recently organised a science symposium on the topic: 'Effect of pollution on quality of life'. You are Amit/Amita Raazdan, editor of the school magazine. Write a report on the event for your school magazine. (120 – 150 words)

PHYSICS

- Try to solve all previous year questions of chapter 1 and chapter 2
- Make a project chartpaper that contain all the derivation of electrostatics.