

DELHI PUBLIC SCHOOL, JAMMU
Sample questions for Term Exam 2019-20
(as per the pattern of CBSE sample paper)

SUBJECT-CHEMISTRY

CLASS-XII

Questions 1 to 5 (Passage type one mark questions)

1. Scuba-divers must cope with high concentrations of dissolved gases while breathing air at high pressure underwater. Increased pressure increases the solubility of the atmospheric gases in blood. When the divers come to the surface, the pressure decreases. This releases dissolved gases and leads to formation of bubbles of nitrogen in blood. This blocks the capillaries and creates medical conditions known as bends, which are painful and dangerous to life. Oxygen level is less at higher altitudes.

- (i) How can you save life of scuba divers?
- (ii) Why are aquatic animals more comfortable in cold water rather than in warm water?
- (iii) What is effect of temp on solubility of gases?
- (iv) The climbers to high altitude have low blood oxygen which makes them weak and unable to think clearly. What is the condition known as?
- (v) How can we solve problem of Anoxia?

2. We have many types of water purifiers. Zero-B is based on disinfecting properties of iodine. UV purifier is based on killing bacteria by UV light. These R.O. purifiers are being used.

- (i) What is the full form of R.O. purifier?
- (ii) What is the function of porous membrane?
- (iii) Which method of purification is more economical for countries using sea water, flash distillation or R.O. for getting potable water? Why?
- (iv) What is the material used for making membrane?
- (v) If none of the purifier is available, what is the best way of purifying water?

3. Two solutions having same osmotic pressure at a given temp. Are called isotonic solutions. The osmotic pressure associated with fluid inside blood cell is equivalent to that of 0.9 % (w/V).

- (i) What precautions should be taken when saline is given intravenously to patients by doctors?
- (ii) If saline has concentration more or less than 0.9%, what should be done and why?
- (iii) What will happen to a hypertonic solution is injected to our body? What is the solution of this problem?
- (iv) What will happen if hypotonic solution is injected to our body?
- (v) What is meant by 0.9 % (w/V) saline solution?

4. A sea driver was facing problems while deep into the water though he was carrying air tank along with. He was feeling discomfort and pain in breathing while ascending. He consulted a doctor who advised him to carry a tank containing a mixture of helium (11.7%), nitrogen (56.2%) and oxygen (32.1%) in place of air. On doing so, his problem was solved and he no longer felt this problem, Read the above narration and answer the following questions:

- i) Why was sea diver facing discomfort while breathing?
- ii) How did doctor help him?

- iii) What is the value associated with the advice given by the doctor?
 - iv) On which application this is based?
 - v) Which gas has the highest solubility out of these three gases?
5. A doctor advised a patient suffering from high blood pressure to take less quantity of the salt.
- i) What is the role of salt in increasing blood pressure?
 - ii) How does low intake of salt help in reducing the blood pressure?
 - iii) What is the value associated with this?

Questions 06 to 10 (one word or one sentence type question of one mark)

- 6. Write Henry's law.
- 7. What happens when blood cells are placed in pure water?
- 8. Two liquids A and B boil at 120°C and 160°C respectively. Which of them has higher Vapour pressure at 70°C ?
- 9. Osmotic pressure of a solution is 0.0821 atm at a temperature of 300 K. Find the Concentration in mole/litre?
- 10. Define azetrope?

Questions 11 to 15(MCQ's type question of one mark)

- 11. The normality of 10% (weight/volume) acetic acid is

(a) 1 N	(b) 10 N
(c) 1.7 N	(d) 0.83 N
- 12. If solubility of any gas in the liquid at 1 bar pressure is 0.05 mol/lit. What will be its solubility at 3 bar pressure, keeping the temperature constant?

(a) 0.05/3 mol/lit	(b) 0.15 mol/lit
(c) 0.05 mol/lit	(d) 1.0 mol/lit
- 13. The highest temperature at which vapour pressure of any liquid can be measured is

(a) Critical temperature	(b) Boyle's temperature
(c) Boiling point of the liquid	(d) Kraft temperature
- 14. An aqueous solution of sugar is taken in a beaker. At freezing point of solution

(a) Crystals of sugar separated	(b) Crystals of glucose and fructose are separated
(c) Crystals of ice separated	(d) Mixture of ice and some sugar crystals separated
- 15. A mixture of two liquids A and B having boiling point of A is 70°C , and boiling point of B is 100°C , distils at 101.2°C as single liquid, hence this mixture is

(a) Ideal solution	(b) Non ideal solution showing +ve deviation
(c) Non ideal solution showing +ve deviation	(d) none of these

Questions 16 to 20 (Assertion Reasoning type question of one mark question)

- (A) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
- (B) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
- (C) Assertion is correct, but reason is wrong statement.

(D) Assertion is wrong, but reason is correct statement.

16. A: Solubility of NaCl increases with temperature.
R: Dissolution of NaCl is an endothermic process.
17. A: 10 ml of liquid A mixed with 20 ml of liquid B total volume of solution is 30 ml.
R: A and B will form ideal solution.
18. A: Lowering of vapour pressure depends upon concentration of solute.
R: Concentration of solute varies with temperature.
19. A: Boiling point of 0.1 M solution of NaCl is higher than that of 0.1 M solution of urea.
R: Greater the value of Van't Hoff factor, greater the elevation in boiling point of solution containing non-volatile solute.
20. A: Hexane and heptane forms ideal solution.
R: $\Delta H, \Delta S$ and ΔG is zero for such type of solution.

Questions 21 to 27 (short type questions of two mark)

21. Determine the molarity of an antifreeze solution containing 250g water mixed with 222g Ethylene glycol ($C_2H_6O_2$) (molar mass 62 g mol^{-1}). The density of this solution is 1.07 g/ml .
22. An aqueous solution containing urea was found to have boiling point more than the normal boiling point of water (373.13 K). When the same solution was cooled, it was found that its freezing point is less than the normal freezing point of water (273.13 K). Explain these observations.
23. a) What is the Van't Hoff factor in $K_4[Fe(CN)_6]$ and $BaCl_2$
b) What is Van't Hoff's factor?
24. Blood cells are isotonic with 0.9% sodium chloride solution. What happens if we placed blood cells in a solution containing?
a) 1.2 % sodium chloride solution.
b) 0.4 % sodium chloride solution.
25. Calculate the boiling point of solution when 4 g of $MgSO_4$ ($M = 120 \text{ g mol}^{-1}$) was dissolved in 100 g of water, assuming $MgSO_4$ undergoes complete ionization. (K_b for water = $0.52 \text{ K Kg mol}^{-1}$).
26. With the help of diagram: show the elevator in boiling point colligative properties?
27. What do you mean by colligative properties, which colligative property is used to determine m.m of polymer and why?

Questions 28 to 34 (short type questions of three mark)

28. 2 g of benzoic acid (C_6H_5COOH) dissolved in 25 g of benzene shows a depression in freezing point equal to 1.62 K. K_f for benzene is $4.9 \text{ K Kg mol}^{-1}$. What is the percentage association of acid if it forms dimer in solution?
29. Osmotic pressure of a 0.0103 molar solution of an electrolyte is found to be 0.70 atm at 27°C . Calculate Van't Hoff factor. ($R = 0.082 \text{ L atm mol}^{-1} \text{ K}^{-1}$)
30. Two elements A and B form compounds of formula AB_2 and AB_4 . When dissolved in 20.0 g of benzene 1.0 g of AB_2 lowers freezing point by 2.3°C whereas 1.0 g of AB_4 lowers freezing point by 1.3°C . The K_f for benzene is 5.4. What will be the atomic masses of A and B.
31. A solution contains 25% water, 25% ethanol and 50% acetic acid by mass. Find mole fraction of each of the component.

32. Conc. H_2SO_4 has a density 1.9g/ml and is 99% H_2SO_4 by weight. Find molarity of solution.
33. Vapour pressure of pure water is 40mm . If a non-volatile solute is added to it, vapour pressure falls by 4 mm . Calculate molality of solution.
34. The vapour pressure of benzene at certain temperature is 640mm Hg . To 39.08g of benzene, non-volatile and non-electrolyte solid weighing 2.175g was added. The vapour pressure of solution was 600mm of Hg. Find the mass of the solute?

Questions 35 to 39 (Long type question of five mark)

35. a) An aqueous solution of a non-volatile and non-electrolyte substance boils at 100.5°C . Calculate osmotic pressure of this solution at 27°C . K_b (for water) per $1000\text{g} = 0.50$.
- b) The Osmotic pressure of human blood is 7.65 atm at 37°C . For injecting glucose solution it is necessary the glucose solution has same osmotic pressure as of human blood. Find the molarity of glucose solution having same osmotic pressure as of human blood.
36. a) A decimolar solution of NaCl exerts osmotic pressure of 4.6 atm at 300K . Find the degree of dissociation Vapour pressure of two liquid A and B are 120 and 180mm Hg at a given temperature.
- b) If 2 mole of A and 3 mole of B are mixed to form an ideal solution, calculate the vapour pressure of solution at the same temperature.
37. a) What is the freezing point of 0.4 molal solution of acetic acid in benzene in which it dimerises to the extent of 85% . Freezing point of benzene is 278.4K and its molar heat of fusion is 10.042kJ mol^{-1} .
- (b) Explain the following:
- Solution of chloroform and acetone is an example of maximum boiling azeotrope.
 - A doctor advised a person suffering from high blood pressure to take less quantity of common salt.
38. (a) Calculate the boiling point of a solution containing 0.61g of benzoic acid in 5 g of CS_2 . Assuming 84% dimerization of acid. The boiling point and K_b of CS_2 are 46.2°C and 2.3 K Kg mol^{-1} respectively.
- (b) State Raoult's law for the solution containing non-volatile solute. Give its mathematical expression also.
39. (a) A 6.2% solution of menthol in cyclohexane freezes at -1.95°C . Determine the molecular mass of menthol. The freezing point and molal depression constant of cyclohexane are 6.5°C and 20.2 K m^{-1} , respectively.
- (b) State Henry's Law and mention its two important applications.
- (c) Which of the following has higher boiling point and why: 0.1 M NaCl or 0.1 M Glucose .