THE ICONIC SCHOOL SUMMER HOLIDAY ASSIGNMENT (2021-22) GRADE – XII SUBJECT – CHEMISTRY



110		
	Solve the questions in your Chemistry notebook.	
1.	How many atoms can be assigned to its unit cell if an element forms :	
	(i) a body centered cubic unit cell (ii) face centered cubic unit cell.	1
2.	Which point defect in a crystal does not alter the density of the solid?	1
3.	What is the C.N. of atoms in <i>bcc</i> and <i>hcp</i> packing ?	1
4.	What is the effect of temperature on solubility of a gas in a solution?	1
5.	Define azeotropic mixture.	1
6.	How are ΔT_b and ΔT_f related to molecular mass of the solute?	1
7.	Differentiate between Ideal and Non – Ideal solutions.	2
8.	Give reasons for the following:	2
	a. When 2 g of benzoic acid is dissolved in 25 g of benzene, the experimentally determined molar	•
	mass is always greater than the true value.	
	b. Mixture of ethanol and acetone always shows positive deviation from Raoult's law.	
9.	What type of azeotropic mixture will be formed by a solution of acetone and chloroform? Justify	
	on the basis of strength of intermolecular interactions that develop in the solution.	2
10	. Which of the following has higher freezing point? Justify your answer.	2
	a. 0.05 M Al ₂ (SO ₄) ₃ b. 0.1 M K ₃ [Fe(CN) ₆]	
11.	. Calculate the packing efficiency of a metal crystal for a simple cubic lattice.	2
12	. What is semi - conductor? Describe the two main types of semiconductors.	2
13.	. What type of substances would make better permanent magnets; ferromagnetic or ferromagnetic?	
	Justify .	2
14	. What are F – centres in ionic crystals? Why crystals having F – centres paramagnetic in nature?	2
15.	. Explain how can you determine the atomic mass of an unknown metal if you know its mass density	y and
	dimensions of unit cell of crystal?	2
16.	. Define the following:	3
	i. Diamagnetism	
	i. Paramagnetism	

- k. Ferromagnetism
- l. Pyroelectricity
- 17. How do metallic and ionic substances differ in conducting electricity?

18.	If the radius of octahedral void is r and the radius of the atom in closed packing is R, derive the	
	relation between r and R.	3
19.	State Henry's law and mention some of its important applications.	3
20.	Draw a graph between vapour pressure and temperature. Also explain the elevation in boiling	
	point of solvent in a solution.	3
21.	Explain giving examples the term ' colligative property'. Why do we sometime get abnormal	
	molecular masses to the substances using colligative properties of the solution.	3
22.	What are the degree of association and degree of dissociation of electrolytes? How are these	
	related to van't Hoff factor?	3
23.	Aluminium metal forms a cubic face centered close packed crystal lattice structure. Its atomic	
	radius is $125 \ge 10^{-12} \text{ m}.$	5
	1. Calculate the length of the side of unit cell.	
	2. How many unit cells are there in 1 m^3 of aluminium.	
24.	The density of lead is 11.35 g cm^3 and the metal crystallizes with fcc unit cell. Estimate radius of	
	lead atom.	5
25.	Density of copper metal is 8.95 g cm^{-3} . if the radius of copper atom is 127.8 pm, predict the nature	
	of its unit cell. (Given atomic mass of $Cu = 63.5 \text{ g mol}^{-1}$)	5
26.	The depression in freezing point of water observed for the same amount of acetic acid,	
	trichloroacetic acid and tri fluoroacetic acid increases in the order given above. Explain .	5
27.	Calculate the depression in freezing point of water when 10 g of CH ₃ CH ₂ CH(<i>Cl</i>)COOH is added	
	to 250 g of water. Ka = 1.4×10^{-3} ; Kf = $1.86 \text{ K kg mol}^{-1}$.	5
28.	Determine the osmotic pressure of a solution prepared by dissolving 25 mg of K ₂ SO ₄ in a 21 of	
	water at 25 °C, assuming that it is completely dissociated.	5
29.	A solution containing 30 g of a non volatile solute exactly in 90 g of water has a vapour pressure	
	of 2.8 k Pa at 298 K. further 18 g of water is added to the solution and the new vapour pressure	
	becomes 2.9 k Pa at 298 K. calculate :	5
	i. Molecular mass of solute	
	j. Vapour pressure of water at 298 K.	
30.	Water is used as a coolant in vehicles. In cars, ethylene glycol is used as a coolant. In cold countries	
	water gets frozen. So it can't act as a coolant. Ethylene glycol is added to water so that its freezing	
	point is lowered and it does not freeze. At hill stations, snow fall takes place. Clearing the snow from	n
	the road is essential for smooth running of traffic.	5
	a. Define freezing point temperature.	
	b. What is the role of ethylene glycol when added to wayter?	

- c. Why does sprinkling of salt help in clearing snow covered roads in hilly areas? Which phenomenon is involved in this process?
- d. If you have a choice between NaCl and $Ca(NO_3)_2$ which salt will you prefer and why?