Std. :XII Science | Subject : Chemistry | Marks : 40

Instructions : | Duration : 1 hour

1. This question paper contain 22 questions and all are compulsory
2. Select proper one option to make statement correct.
3. Atomic weight of Na = 23, Cl = 35.5,H=1,O=16.
4. Figure to right indicate full marks.

1. A solution of urea contain 8.6 gm/litre (*mol. wt.* 60.0). It is isotonic with a 5% solution of a non-volatile solute. The molecular weight of the solute will be, **[3]**

(a) 348.9 (b) 34.89 (c) 3489 (d) 861.2

2. Potassium has a *bcc* structure with nearest neighbour distance 4.52 $\mathring{A}$. Its atomic weight is 39. Its density (in $kg\ \ m^{-3}$) will be, **[3]**

(a) 454 (b) 804 (c) 852 (d) 908

3. Which one of the following processes does not occur during formation of $CHCl_3$ from C_2H_5OH and bleaching powder, **[3]**

(a) Hydrolysis (b) Oxidation (c) Reduction (d) Chlorination

4. Dry air was passed successively through a solution of $5\ gm$ of a solute in $80\ gm$ of water and then through pure water. The loss in weight of solution was $2.50\ gm$ and that of pure solvent $0.04\ gm$. What is the molecular weight of the solute, **[4]**

(a) 70.31 (b) 7.143 (c) 714.3 (d) 80

5. In a solid '*AB*' having the *NaCl* structure, '*A*' atoms occupy the corners of the cubic unit cell. If all the face-centered atoms along one of the axes are removed, then the resultant stoichiometry of the solid is, **[4]**

(a) AB_2 (b) A_2B (c) A_4B_3 (d) A_3B_4

6. Which solid will have the weakest intermolecular forces, **[1]**

(a) Ice (b) Phosphorus (c) Naphthalene (d) Sodium fluoride

7. The crystal system of a compound with unit cell dimensions $a = 0.387$, $b = 0.387$ and $c = 0.504nm$ and $\alpha = \beta = 90^{o}$ and $\gamma = 120^{o}$ is, **[1]**

(a) Cubic (b) Hexagonal (c) Orthorhombic (d) Rhombohedral

8. If '*Z*' is the number of atoms in the unit cell that represents the closest packing sequence $--\ A\ B\ C\ A\ B\ C--\ --$, the number of tetrahedral voids in the unit cell is equal to, **[1]**

(a) *Z* (b) 2 *Z* (c) Z/2 (d) Z/4

9. The statement "If 0.003 moles of a gas are dissolved in 900 *g* of water under a pressure of 1 atmosphere, 0.006 *moles* will be dissolved under a pressure of 2 atmospheres", illustrates. **[1]**

(a) Dalton's law of partial pressure (b) Graham's law (c) Raoult's law (d) Henry's law

10. Dilute one litre 1 molar H_2SO_4 solution by 5 litre water, the normality of that solution is, **[1]**

(a) $0.2N$ (b) $5\ N$ (c) $10\ N$ (d) $0.33\ N$

11. Increasing the temperature of an aqueous solution will cause, **[1]**

(a) Decrease in molality (b) Decrease in molarity

(c) Decrease in mole fraction (d) Decrease in % *w/w*

12. Number of π – bonds present in *B.H.C.* (Benzene hexachloride) are, **[1]**

(a) 6 (b) Zero (c) 3 (d) 12

13. 2, 6 - Dimethylheptane on monochlorination produces……. Derivatives, **[1]**

(a) 5 (b) 6 (c) 3 (d) 4

14. For a given alkyl group the densities of the halides follow the order, **[1]**

(a) $RI < RBr < RCl$ (b) $RI < RCl < RBr$ (c) $RBr < RI < RCl$ (d) $RCl < RBr < RI$

15. On treating a mixture of two alkyl halides with sodium metal in dry ether, 2-methyl propane was obtained. The alkyl halides are, **[1]**

(a) 2-chloropropane and chloromethane (b) 2-chloropropane and chloroethane

(c) Chloromethane and chloroethane (d) Chloromethane and 1-chloropropane

16. Which of the following is used in fire extinguishers, **[1]**

(a) CH_4 (b) $CHCl_3$ (c) CH_2Cl_2 (d) CCl_4

17. The vapour pressure lowering caused by the addition of 100 *g* of sucrose (molecular mass = 342) to 1000 *g* of water if the vapour pressure of pure water at $25^\circ C$ is 23.8 *mm Hg*, **[2]**

(a) 1.25 *mm Hg* (b) 0.125 *mm Hg* (c) 1.15 *mm Hg* (d) 00.12 *mm Hg*

18. If for a sucrose solution elevation in boiling point is $0.1^\circ C$ then what will be the boiling point of *NaCl* solution for same molal concentration, **[2]**

(a) $0.1^\circ C$ (b) $0.2^\circ C$ (c) $0.08^\circ C$ (d) $0.01^\circ C$

19. The number of unit cells in 58.5 *g* of *NaCl* is nearly, **[2]**

(a) 6×10^{20} (b) 3×10^{22} (c) 1.5×10^{23} (d) 0.5×10^{24}

20. The pyknometric density of sodium chloride crystal is $2.165\times10^3 kg\ m^{-3}$ while its *X*-rays density is $2.178\times10^3 kg\ m^{-3}$. The fraction of unoccupied sites in sodium chloride crystal is, **[2]**

(a) 5.96×10^{-3} (b) 5.96 (c) 5.96×10^{-2} (d) 5.96×10^{1}

21. Ethylene dichloride and ethylidine chloride are isomeric compounds. The false statement about these isomers is that they, **[2]**

(a) React with alcoholic potash and give the same product

(b) Are position isomers

(c) Contain the same percentage of chlorine

(d) Are both hydrolysed to the same product

22. In the following sequence of reactions **[2]**

$CH_3CH_2CH_2Br \xrightarrow{KOH(alc.)} (A) \xrightarrow{HBr} (B) \xrightarrow{KOH\ (aq.)} (C)$, The product (*C*) is

(a) Propan – 2 – *ol* (b) Propan – 1 – *ol* (c) Propyne (d) Propene