V11C

Virudhunagar District

Common Second Mid Term Test - 2024

Standard 11

CHEMISTRY

Time: 1.30 Hrs. Marks: 50

Part - I

Choose the correct answer and answer all the questions: **10×1=10**

1) Which is the correct sequence of solubility of carbonates of alkaline earth metals?
   a) $BaCO_3 > SrCO_3 > CaCO_3 > MgCO_3$
   b) $MgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$
   c) $CaCO_3 > BaCO_3 > SrCO_3 > MgCO_3$
   d) $BaCO_3 > CaCO_3 > SrCO_3 > MgCO_3$

2) **Assertion** : Generally alkali and alkaline earth metals forms super oxides.
   Reason : There is a single bond between O and O in superoxides.
   a) Both assertion and reason are true and reason is the correct explanation of assertion.
   b) Both assertion and reason are true but reason is not the correct explanation of assertion.
   c) Assertion is true but reason is false.
   d) Both assertion and reason are false.

3) P_1 and P_2 are the vapour pressures of pure liquid components 1 and 2 respectively of an ideal binary solution if X_1 represents the mole fraction of component 1, the total pressure of the solution formed by 1 and 2 will be
   a) $P_1+X_1(P_2-P_1)$ b) $P_2-X_1(P_2+P_1)$
   c) $P_1-X_2(P_1-P_2)$ d) $P_1+X_2(P_1-P_2)$

4) Which one of the following bianry liquid mixtures exhibits positive deviation from Raoult's law?
   a) Acetone + Chloroform b) Water + Nitric acid
   c) HCl + Water d) Ethanol + Water

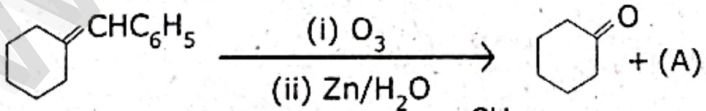
5) Which one of the following is diamagnetic?
   a) O_2 b) O_2^{2-} c) O_2^{+} d) None of these

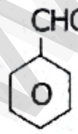
6) Shape and hybridisation of IF_5 are
   a) Trigonal bipyramidal, sp^3d^2 b) Trigonal bipyramidal, sp^3d
   c) Square pyramidal, sp^3d^2 d) Octahedral, sp^3d^2

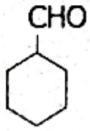
7) The general formula for cyclo alhanes
   a) C_nH_n b) C_nH_{2n} c) C_nH_{2n-1} d) C_nH_{2n+2}

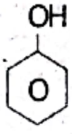
8) The compound formed at anode in the electrolysis of an aquous solution of potassium acetate are
   a) CH_4 and H_2 b) CH_4 and CO_2 c) C_2H_6 and CO_2 d) C_2H_5 and Cl_2

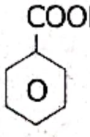
9) Identify the compound (A) in the following reaction.



a) 

b) 

c) 

d) 

10) Peroxide effect (Kharasch effect) can be studied in case of
   a) oct-4-ene b) hex-3-ene c) pent-1-ene d) but-2-ene

Part - II

Answer any five questions and Question No. 17 is compulsory: **5×2=10**

11) Why sodium hydroxide is much more water soluble than sodium chloride?
12) State and explain Henry's law.

13) Calculate the molality of a solution containing 7.5g of glycine (NH_2-CH_2-COOH) dissolved in 500g of water.
14) Bond angle in PH_4^+ is higher than in PH_3 why?
15) Explain $3P^2$ hybridisation in BF_3.
16) Suggest a simple chemical test to distinguish propane and propene.
17) The compound (A), on heating gives a colourless gas and a residue (B) that is dissolved in water to obtain (C). Find A, B, C and write its correct equation.

Part - III

Answer any five questions and Question No. 24 is compulsory: **5×3=15**

18) Write the chemical equations for the reactions involved in solvay process of preparation of sodium carbonate.
19) What is a vapour pressure of liquid? What is relative lowering of vapour pressure?
20) Explain why the equatic species are more comfortable in cold water during winter season rather than warm water during the summer.
21) In CH_4, NH_3 and H_2O the central atom undergoes sp^3 hybridisation - yet their bond angle are different why?
22) Define the following: (i) Bond order (ii) Hybridisation
23) How does Huckel rule help to decide the aromatic character of a compound?
24) The observed depression in freezing point of water for a particular solution is 0.093°C. Calculate the concentration of the solution in molality. Given that molal depression constant for water is 1.86 K Kg mol^{-1}.

Part - IV

Answer all questions: **3×5=15**

25) a) Alkaline earth metal (A), belongs to 3rd period reacts with oxygen and nitrogen to form compound (B) and (C) respectively. It undergoes metal displacement reaction with $AgNO_3$. Solution to form compound (D). Identity A, B, C and D.

(OR)

b) i) Discuss the similarities between beryllium and aluminium.
ii) Why alkaline earth meatls are harder than alkali metals?

26) a) State Raoult law and obtain expression for lowering of vapour pressure when non volatile solute in dissolved in solvent.

(OR)

b) Discuss the formation of N_2 molecule using MO theory.

27) a) Describe the conformers of n-butane.

(OR)

b) **Complete the following:**

i) 2-butyne $\xrightarrow{\text{Lindlar catalyst}}$

ii) $CH_2 = CH_2 \xrightarrow{I_2}$

iii) $CH_2(Br) - CH_2(Br) \xrightarrow{Zn/C_2H_5OH}$

iv) $CaC_2 \xrightarrow{H_2O}$
