

# Model Question Paper

(10+2) Class (Session : 2020-21)

(Chemistry) (Regular)

Maximum Marks : 60

Time Allowed : 3 hrs

Special Instructions:-

- (i) You must indicate on your answer book the same question no. as appears in your question paper.
- (ii) All questions are compulsory. Internal choices have been given in some questions.
- (iii) Marks allotted to each question are indicated against each.
- (iv) Draw neat and clean diagram where ever necessary.

1. Relationship between atomic radius (r) and the edge length (a) of a body centered cubic unit cell is 1

(a)  $r = \frac{a}{2}$

(b)  $r = \frac{\sqrt{a}}{2}$

(c)  $r = \frac{\sqrt{3}}{4}a$

(d)  $r = \frac{3a}{2}$

2. Partial vapour pressure of a solution component is directly proportional to its mole fraction. It is known as 1

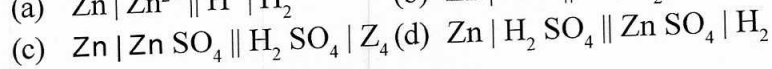
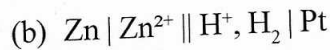
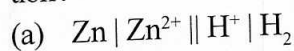
(a) Henry's Law

(b) Raoult's Law

(c) Distribution Law

(d) Ostwald's Law

3. Which of the following is correct representation of Galvanic cell reaction: 1



4. The unit of rate constant for the reaction 1  
 $2\text{H}_2 + 2\text{NO} \rightarrow 2\text{H}_2\text{O} + \text{N}_2$   
 Rate =  $K [\text{H}_2] [\text{NO}]^2$   
 (a)  $\text{mol L}^{-1} \text{s}^{-1}$  (b)  $\text{s}^{-1}$   
 (c)  $\text{mol}^{-2} \text{L}^2 \text{S}^{-1}$  (d)  $\text{mol L}^{-1}$
5. Nitrogen combines with metals to form 1  
 (a) nitrites (b) nitrates  
 (c) nitrosyl chloride (d) nitrides
6. Which of the following is non reducing sugar? 1  
 (a) Glucose (b) Sucrose  
 (c) Maltose (d) Lactose
7. Correct order of esterification of alcohol is 1  
 (a)  $3^\circ > 1^\circ > 2^\circ$  (b)  $2^\circ > 3^\circ > 1^\circ$   
 (c)  $1^\circ > 2^\circ > 3^\circ$  (d) none of these
8. Which of the following carboxylic acids is highly insoluble in water? 1  
 (a) propanoic acid (b) butanoic acid  
 (c) acetic acid (d) decanoic acid
9. The S in buna-S refers to 1  
 (a) sulphur (b) styrene  
 (c) sodium (d) salicylate
10. A drug used for curing malaria is 1  
 (a) aspirin (b) quinine  
 (c) morphine (d) analgine
11. "Ionic solids conduct electricity in molten state but not in solid state".  
 Explain the statement. 2

**Or**

If radius of octahedral void is  $r$  and radius of atom in close packing is  $R$ ,  
 derive relation between  $r$  and  $R$ . 2

12. What role does the molecular interactions play in a solution of water  
 and alcohol? 2

**Or**

Calculate mass of a non-volatile solute (molar mass  $40\text{g mol}^{-1}$ ) which should be dissolved in 114g octane to reduce its vapour pressure to 80% 2

13. (a) Define molal elevation constant. 1  
(b) Define the term chemotherapy 1
14. What happens when  
(a) Chlorobenzene is subjected to hydrolysis? 1  
(b) Ethyl chloride is treated with aqueous KOH? 1
15. Define leaching. Discuss process of leaching of alumina from bauxite. 2

**Or**

Discuss froth flotation process for removing gangue from sulphide ores. 2

16. (a) How would you convert propene into propan-2-ol? 1  
(b) Explain why propanol has higher boiling point than that of hydrocarbon butane? 1
17. (a) Explain Williamson synthesis with help of example. 1  
(b) Why cannot vitamin C be stored in our body? 1
18. (a) Write reaction of thermal decomposition of sodium azide. 1  
(b) How do you account for the reducing behaviour of  $\text{H}_3\text{PO}_2$  on the basis of its structure? 1

**Or**

- (a) Why is  $\text{N}_2$  less reactive at room temperature? 1  
(b)  $\text{H}_2\text{S}$  is less acidic than  $\text{H}_2\text{Te}$ . Why? 1
19. (a) Give two examples to show the anomalous behaviour of fluorine 1  
(b) Give the reason for bleaching action of  $\text{Cl}_2$ . 1

**Or**

- (a) Noble gases have very low boiling points. Why? 1  
(b) Explain hydrolysis reaction of  $\text{XeF}_4$ . 1
20. Derive integrated rate equation for first order reaction. 2

**Or**

In a reaction  $2A \rightarrow \text{Products}$ , the concentration of A decreases from  $0.5 \text{ mol L}^{-1}$  to  $0.4 \text{ mol L}^{-1}$  in 10 minutes. calculate the rate during this interval.

21. (a) Give difference between lyophilic and lyophobic colloids. 2  
 (b) What do you understand by adsorption? 1
- Or**
- (a) Give difference between physisorption and chemisorption. 2  
 (b) Explain Tyndall effect with help of diagram. 1
22. (a) Write IUPAC name of  $[\text{K}_3(\text{NH}_3)_6]\text{Cl}_3$  1  
 (b) On basis of valence bond theory explain the geometry and magnetic behaviour of  $[\text{Ni}(\text{C}_4\text{H}_8)]^{2-}$  2
- Or**
- (a) What are didentate ligands? 1  
 (b)  $[\text{Ni}(\text{C}_4\text{H}_8)]^{2-}$  is paramagnetic where as  $[\text{Fe}(\text{CN})_6]^{3-}$  is weakly paramagnetic. Explain. 2
23. (a) Write the following reactions 2  
 (i) Decarboxylation reaction  
 (ii) Cannizzaro reaction.  
 (b) How will you convert acetophenone to benzoic acid? 1
24. (a) How do you explain amphoteric behaviour of amino acids? 2  
 (b) What do you mean by vulcanisation of rubber? 1
25. (a) Describe a method for identification of primary, secondary and tertiary amines. 2  
 (b) What are addition polymers? 1
- Or**
- (a) Why cannot aromatic primary amines be prepared by Gabriel phthalimide synthesis? 2  
 (b) What are thermosetting polymers? 1
26. (a) A solution of  $\text{CuSO}_4$  is electrolysed for 10 minutes with a current of 1.5 amperes. What is mass of copper deposited at cathode? 2

- (b) Explain why transition metals form compounds in different oxidation states? 2
- (c) Why do Zr and Hf exhibit similar properties? 2

**Or**

- (a) How does Kohlrausch law help in calculating the degree of dissociation of weak electrolyte? 2
- (b) What is lanthanoid contraction? What is cause of lanthanoid contraction? 2
- (c) Why  $Zn^{2+}$  salts are white while  $Ni^{2+}$  salts are blue? 1
27. (a) Out of  $C_6H_5CH_2Cl$  and  $C_6H_5CHClC_6H_5$  which is more easily hydrolysed by aqueous KOH. 2
- (b) Why are  $Mn^{2+}$  compounds are more stable than  $Fe^{2+}$  compounds? 2
- (c) Define instantaneous rate of reaction. 1
28. (a) How is cell constant and specific conductance related to one another? 1
- (b) Why standard hydrogen electrode is called reversible electrode? 1
- (c) Fluorine always exhibits an oxidation state of  $-1$ . Give reasons. 1
- (d) What is Gattermann Koch reaction? 1
- (e) What is invert sugar. 1