Question Paper

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

(Chemistry) (Regular)

Time Allowed : 3 hrs **Maximum Marks : 60**

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

(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

(a) $Zn \mid Zn^{2+} \parallel H^{+} \mid H_2$ (b) $Zn \mid Zn^{2+} \parallel H^{+}, H_2 \mid Pt$

(c) $Zn \mid Zn\,SO_4 \parallel H_2\,SO_4 \mid Z_4$ (d) $Zn \mid H_2\,SO_4 \parallel Zn\,SO_4 \mid H_2$

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4. The unit of rate constant for the reaction 1

$2H_2 + 2NO \rightarrow 2H_2O + N_2$

Rate = $K[H_2][NO]^2$

(a) mol L^{-1} s^{-1} (b) s^{-1}

(c) $mol^{-2} L^2 S^{-1}$ (d) 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) $3° > 1° > 2°$ (b) $2° > 3° > 1°$

(c) $1° > 2° > 3°$ (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 octaledral 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

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Or

Calculate mass of a non-volatile solute (molar mass 40g 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 froath flatation process for removing gangue from sulphide ores. 2

16. (a) How would you convert propene into propan-2-ol? 1
    (b) Explane 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 decompositon of sodium azide. 1
    (b) How do you account for the reducing behaviour of H_3PO_2 on the basis of its structure? 1

Or

    (a) Why is N_2 less reactive at room temperature? 1
    (b) H_2S is less acidic than H_2Te. Why? 1
19. (a) Give two example to show the anomalous behaviour of fluorine 1
    (b) Give the reason for bleaching action of Cl_2. 1

Or

    (a) Noble gases have very low boiling points. Why? 1
    (b) Explain hydrolysis reaction of XeF_4. 1
20. Derive integrated rate equation for first order reaction. 2

Or

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

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 $[K_3(NH_3)_6]Cl_3$ 1
    (b) On basis of valence bond theory explain the geometry and magnetic behaviour of $[Ni(CN)_4]^{-2}$ 2

Or

    (a) What are didentate ligands? 1
    (b) $[NiCl_4]^{-2}$ is paramagnetic where as $[Fe(CN)_6]^{-3}$ 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 $CuSO_4$ is electrolysed for 10 minutes with a current of 1.5 amperes. What is mass of copper deposited at cathode? 2

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(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 electrolyle? 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

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