

**Class : 12**Register  
Number**COMMON HALF YEARLY EXAMINATION 2024-25**

Time Allowed : 3.00 Hours]

**CHEMISTRY**  
PART - I

[Max. Marks : 70

15x1=15

- I. Choose the correct answer.
- The magnetic moment of  $Fe^{3+}$  ion is  
a) 5.92BM                      b) 2.80BM                      c) 8.95BM                      d) 3.90BM
  - The crystal with a metal deficiency defect is  
a) NaCl                      b) FeO                      c) ZnO                      d) KCl
  - Leaching is based on  
a) Solubility                      b) Melting                      c) Boiling                      d) Density
  - The solubility of AgCl (s) with solubility product  $1.6 \times 10^{-10}$  in 0.1M NaCl solution would be  
a)  $1.26 \times 10^{-5}$  M                      b)  $1.6 \times 10^{-9}$  M                      c)  $1.6 \times 10^{-11}$  M                      d) Zero
  - How many faradays of electricity are required for the following reaction to occur?  
 $Cr_2O_7^{2-} \rightarrow Cr^{3+}$   
a) 5F                      b) 3F                      c) 1F                      d) 7F
  - The phenomenon observed when a beam of light is passed through a colloidal solution is  
a) Cataphoresis                      b) Electrophoresis                      c) Coagulation                      d) Tyndall effect
  - Assertion : Phenol is more acidic than ethanol  
Reason : Phenoxide ion is resonance stabilized  
a) If both assertion and reason are true and reason is the correct explanation of assertion.  
b) If 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.
  - Which one of the following reaction is an example of disproportionation reaction?  
a) Aldol condensation                      b) Cannizzaro reaction  
c) Benzoin condensation                      d) None of these
  - Which of the following reagent can be used to convert nitrobenzene to aniline  
a) Sn/HCl                      b) Zn/Hg/NaOH                      c)  $LiAlH_4$                       d) All of these
  - In aqueous solution of amino acids mostly exists in,  
a)  $NH_2-CH(R)-COOH$                       b)  $NH_2-CH(R)-COO^-$   
c)  $H_3N^+-CH(R)-COOH$                       d)  $H_3N^+-CH(R)-COO^-$
  - Match items in column - I with the items of column - II and assign the correct code.  

Column - I		Column - II		A	B	C	D
A. Cyanide process	i	Ultrapure Ge	a)	i	ii	iii	iv
B. Froth floatation process	ii	Dressing of ZnS	b)	iii	iv	v	i
C. Electrolytic reduction	iii	Extraction of Al	c)	iv	ii	iii	i
D. Zone refining	iv	Extraction of Au	d)	ii	iii	i	v
	v	Purification of Ni					
  - An aqueous solution of borax is  
a) Neutral                      b) Acidic                      c) basic                      d) Amphoteric
  - Inert gas radon (Rn) used in  
a) Balloons                      b) Laser lights  
c) Photographic lights                      d) Cancer treatment
  - IUPAC name of the complex  $K_3[Al(C_2O_4)_3]$  is  
a) potassiumtrioxalatoaluminium(III)                      b) potassiumtrioxalatoaluminate(II)  
c) potassiumtrisoxalatoaluminate(III)                      d) potassiumtrioxalatoaluminate(III)
  - If the initial concentration of the reactant is doubled, the time for half reaction is also doubled. Then the order of the reaction is  
a) Zero                      b) one                      c) Fraction                      d) none

**PART - II**

- II. Answer any SIX questions. Q.No.24 is Compulsory
- What are the various steps involved in extraction of pure metals from their ores? 6x2=12
  - Aluminum (III) Chloride is more stable whereas Thallium (III) Chloride is highly unstable. Why?
- TPR/12/Che/1A

18.  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  is coloured whereas  $[\text{Sc}(\text{H}_2\text{O})_6]^{3+}$  is colourless. Why?
19. Which is more stable  $\text{Fe}^{3+}$  or  $\text{Fe}^{2+}$ ? Why?
20. What is Zwitter ion
21. What is catalytic poison?
22. Write Schotten Baumann reaction.
23. Ethylamine dissolves in water while aniline will not dissolve in water. Why?
24. Calculate  $\text{pH}$  of  $10^{-7}$  M HCl.

## PART – III

III. Answer any SIX questions .Q.No.33 is Compulsory.

6x3=18

25. What are interhalogen compounds? Give examples
26. How will you identify borate radical by ethyl borate test.
27. Why transition metal forms large number of complexes. Give examples.
28. Give Arrhenius equation.
29. What is Kohlrausch's law .What are the uses of Kohlrausch's law?
30. What is Helmholtz electrical double layer?
31. What is Baeyer's reagent? How will you convert Ethene into ethylene glycol using this?
32. Write Stephen's reaction.
33. A hydride of 2<sup>nd</sup> period alkali metal (A) on reaction with compound of Boron (B) to give a reducing agent (C). Identify A, B and C

## PART – IV

IV. Answer all the questions.

5x5=25

34. a) i) Describe a method for refining Nickel by Mond process? (2)  
ii) Explain zone refining. (3)  
(OR)
- b) i) How is potash alum obtained? (2)  
ii) Explain the structures of Graphite and Diamond. (3)
35. a) i) Differentiate lanthanoids and actinoids. (Any two points)(2)  
ii) Write the postulates of Werner Theory. (3)  
(OR)
- b) i) Calculate the percentage efficiency of packing in case of body centered cubic crystal. (3)  
ii) If the rate constant of a first order reaction is  $1.54 \times 10^{-3} \text{ S}^{-1}$ . Calculate its half-life period. (2)
36. a) i) Calculate solubility product of  $\text{Ca}_3(\text{PO}_4)_2$ . (2)  
ii) Derive the rate constant for a first order reaction. (3)  
(OR)
- b) i) Derive Nernst equation.(3)  
ii) Give Faraday's second law.(2)
37. a) i) Explain briefly the intermediate compound formation theory of catalysis.(3)  
ii) Write Kolbe's or Kolbe's Schmitt reaction(2)  
(OR)
- a) How do you convert the following?  
i) Phenol  $\rightarrow$  Phenolphthalein(1.5)      ii) Ethylene glycol  $\rightarrow$  1,4 – di oxane(1.5)  
b) Write Rosenmund reduction (2)
38. a) i) Compound A with molecular formula  $\text{C}_7\text{H}_6\text{O}$  reduces tollen's reagent. A on reaction with 50% NaOH gives compound B with molecular formula  $\text{C}_7\text{H}_6\text{O}$  and compound C with molecular formula  $\text{C}_7\text{H}_6\text{O}_2\text{Na}$ . Compound C react with dil.HCl gives compound D with molecular formula  $\text{C}_7\text{H}_6\text{O}_2$ . Compound D on heating with sodalime gives compound E. Identify A,B,C,D and E, write the reaction involved.(3)  
ii) Identify the compounds A & B in the following reaction. (2)  
$$\text{C}_6\text{H}_5\text{NO}_2 + 6(\text{H}) \xrightarrow{\text{Sn/HCl}} \text{A} \xrightarrow[273\text{K}]{\text{HNO}_2} \text{B} \quad (\text{OR})$$
- b) i) Determine the structure of glucose. (3)  
ii) Give any three differences between DNA and RNA (2)

TPR/12/Che/2