

A

## COMMON HALF YEARLY EXAMINATION - 2023

Standard XII

Reg No 

1	2	3	0	0	1
---	---	---	---	---	---

CHEMISTRY

Marks : 70

Time : 3.00 hrs

Part - I

15 × 1 = 15

I. Choose the correct answer:

- Which one of the following reaction represents calcination?
  - $2Zn + O_2 \rightarrow 2ZnO$
  - $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$
  - $MgCO_3 \rightarrow MgO + CO_2$
  - Both (a) and (c)
- Which among the following mixture is producer gas?
  - $H_2 + CO$
  - $N_2 + CO$
  - $H_2 + CO_2$
  - $N_2 + CO_2$
- $HCOOH + H_2SO_4 \rightarrow CO + H_2SO_4 \cdot H_2O$   
In the above reaction, sulfuric acid acts as a
  - reducing agent
  - oxidising agent
  - chlorinating agent
  - dehydrating agent
- Choose the correct statement.
  - Square planar complexes are more stable than octahedral complexes
  - Crystal field stabilization energy of  $[V(H_2O)_6]^{2+}$  is higher than the crystal field stabilization of  $[Ti(H_2O)_6]^{2+}$
  - The spin only magnetic moment of  $[CuCl_4]^{2-}$  is 1.732 BM and it has square planar structure
  - CFSE( $\Delta_o$ ) of  $[FeF_6]^{4-}$  is higher than the  $\Delta_o$  of  $[Fe(CN)_6]^{4-}$
- Which of the following lanthanoid ion is diamagnetic?
  - $Eu^{2+}$
  - $Yb^{2+}$
  - $Ce^{2+}$
  - $Sm^{2+}$
- Diamond is an example of
  - covalent solid
  - metallic solid
  - molecular solid
  - ionic solid
- For a first order reaction, the rate constant is  $6.909 \text{ min}^{-1}$ , the time taken for 75% conversion in minutes is
  - $\left(\frac{3}{2}\right) \log 2$
  - $\left(\frac{2}{3}\right) \log 2$
  - $\left(\frac{3}{2}\right) \log \left(\frac{3}{4}\right)$
  - $\left(\frac{2}{3}\right) \log \left(\frac{4}{3}\right)$
- Which of the following represents hydrolysis of salt of strong acid and weak base
  - $pH = 7 + \frac{1}{2} pK_a + \frac{1}{2} \log C$
  - $pH = 7 - \frac{1}{2} pK_b - \frac{1}{2} \log C$
  - $pH = 7 + \frac{1}{2} pK_a - \frac{1}{2} pK_b$
  - $pH = 7 - \frac{1}{2} pK_a + \frac{1}{2} pK_b$
- Identify the mathematical expression of Faraday's second law
  - $m \propto Q$
  - $W_{max} = -nFE$
  - $\lambda_m = \frac{k \cdot 10^{-3}}{N}$
  - $m \propto Z$

10. Which one of the following is correctly matched?
- |                   |   |        |  |  |
|-------------------|---|--------|--|--|
| i) Emulsion       | - | Smoke  |  |  |
| ii) Gel           | - | Butter |  |  |
| iii) Foam         | - | Mist   |  |  |
| iv) Whipped cream | - | Sol    |  |  |
- a) i                      b) ii                      c) iii                      d) iv
11.  $\text{HO}-\text{CH}_2-\text{CH}_2-\text{OH}$  on heating with periodic acid gives
- a) methanoic acid      b) glyoxal              c) methanal              d)  $\text{CO}_2$
12. Which one of the following reaction is an example of disproportionation reaction?
- a) aldol condensation      b) cannizaro reaction
- c) benzoin condensation      d) none of these
13. Which one of the following is most basic?
- a) 2,4-dichloro aniline      b) 2,4-dimethyl aniline
- c) 2,4-dinitro aniline      d) 2,4-dibromo aniline
14. Which of the following is a monosaccharide?
- a) sucrose                  b) galactose              c) lactose                  d) maltose
15. Nylon is an example of
- a) pyramid                  b) polythene              c) polyester                  d) polysaccharide

## Part - II

II. Answer any 6 questions. (Q.No.24 is compulsory)

6 x 2 = 12

16. Write down the difference between Minerals and Ores.
17. Give one example for each of the following :
- i) chalcogens      b) tetragens      c) pnictogens      d) chalcogens
18. Draw the structure of  $\text{SO}_2$ .
19. Define Unit cell.
20. Define pH of a solution.
21. What is electrochemical series?
22. What happens when phenol reacts with zinc dust?
23. Give the tests for aldehydes.
24. The rate constant for a first order reaction is  $1.54 \times 10^{-3} \text{ S}^{-1}$ . Calculate its half life time.

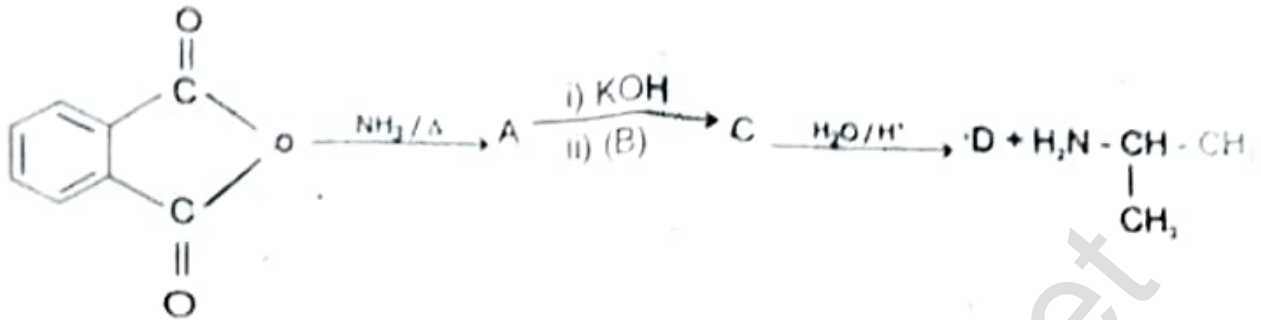
## Part - III

III. Answer any 6 questions. (Q.No.33 is compulsory)

6 x 3 = 18

25. How is phosphine prepared?
26. Write down the differences between Lanthanides and Actinides.
27. Explain linkage isomerism with an example.
28. d-block elements exhibit variable oxidation state. Why?

29. Derive the relation between pH and pOH.  
 30. State Kohlrausch's Law.  
 31. Explain Williamson Ether synthesis.  
 32. Explain a test used to identify primary amines.  
 33. Predict A, B, C and D for the following reaction.



## Part - IV

## IV. Answer all the questions.

5 x 5 = 25

34. a) Explain Froth flotation process.  
 (OR)  
 b) i) Write a note on Ethyl Borate test.  
 ii) What are inter halogen compounds?
35. a) i) Write any two conditions for catenation.  
 ii) Why HF cannot be stored in glass bottles?  
 (OR)  
 b) Write the postulates of Werner's theory.
36. a) i) Why ionic crystals are hard and brittle?  
 ii) Write a note on Frenkel defect.  
 (OR)  
 b) i) Write the Arrhenius equation and explain the terms.  
 ii) Explain pseudo first order reaction with an example.
37. a) Derive Ostwald's dilution law.  
 (OR)  
 b) i) Write a note on fuel cell.  
 ii) How are colloids prepared by ultrasonic dispersion.
38. a) Write a note on  
 i) Cannizzaro reaction  
 ii) Gomberg reaction  
 (OR)  
 b) Explain the structure of glucose.  
 .....