12 P

Register No.

Half Yearly Examination- 2024

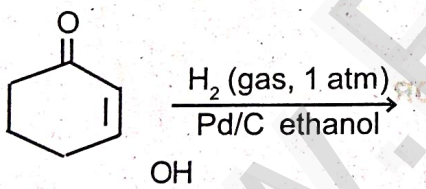
CHEMISTRY

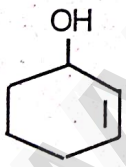
Time : 3.00 Hrs. 20.12.24 Marks : 70

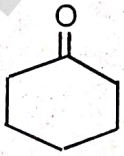
PART - I

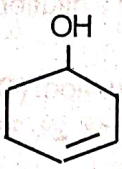
Answer all the questions. **15 x 1 = 15**

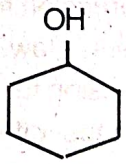
1. Bauxite has the composition
   a) Al_2O_3 b) $Al_2O_3 nH_2O$ c) $Fe_2O_3 2H_2O$ d) None of these
2. Which among the following is not a borane?
   a) B_2H_6 b) B_3H_6 c) B_4H_{10} d) None of these
3. The basicity of pyrophosphorous acid ($H_4P_2O_5$) is
   a) 4 b) 2 c) 3 d) 5
4. Which of the following oxidation states is most common among the Lanthanides?
   a) +4 b) +2 c) +5 d) +3
5. Which type of isomerism is exhibited by [Pt $(NH_3)_2$ $C\ell_2$]?
   a) Coordination isomerism b) Linkage isomerism c) Optical isomerism d) Geometrical isomerism
6. The crystal with a metal deficiency defect is
   a) NaCℓ b) FeO c) ZnO d) KCℓ
7. The addition of a catalyst during a chemical reaction alters which of the following quantities?
   a) Enthalpy b) Activation energy c) Entropy d) Internal energy
8. The pH of 10^{-5} m KOH solution will be
   a) 9 b) 5 c) 19 d) none of these
9. The number of electrons that have a total charge of 9650 coulombs is
   a) 6.22×10^{23} b) 6.022×10^{24} c) 6.022×10^{22} d) 6.022×10^{-34}
10. Fog is colloidal solution of
    a) solid in gas b) gas in gas c) liquid in gas d) gas in liquid
11. The number of –COOH group in picric acid is
    a) 0 b) 1 c) 2 d) 3
12. The correct structure of the product 'A' formed in the reaction.



a) 

b) 

c) 

d) 

13. Which one of the following will ot undergo Hofmann bromamide reaction?
    a) $CH_3CONHCH_3$ b) $CH_3CH_2CONH_2$ c) CH_3CONH_2 d) $C_6H_5CONH_2$
14. Which one given below is a non-reducing sugar.
    a) Glucose b) Sucrose c) Maltose d) Lactose
15. Nylon is an example of
    a) polyamide b) polythene c) polyester d) poly saccharide

PART - II

Answer any six questions. Q.Number 24 is compulsory. **6 x 2 = 12**

16. What are the difference between minerals and ores?
17. What is inert pair effect?
18. Write the uses of oxygen.
19. Define unit cell.
20. Define half life of a reaction.
21. What is common ion effect?
22. How is phenol prepared from Dow's process?
23. Write a short note on peptide bond.
24. Write the IUPAC name and co-ordination number of the given compound. $[Cu(NH_3)_2 C\ell_2]$

PART - III

Answer any six questions. Question number 33 is compulsory. **6 x 3 = 18**

25. Describe briefly the catenation property of carbon.
26. What are interstitial compounds? Write their properties.
27. Explain pseudo first order reaction with an example.
28. Describe the construction of Daniel cell. Write the cell reaction.
29. Describe adsorption theory of catalysis.
30. How do you prepare Acrolein?
31. How will you prepare Malachite green?
32. What are antacids? Give an example.
33. Identify A, B, C in the following reaction : $C_6H_5N_2C\ell \xrightarrow{CuCN} A \xrightarrow{H_2O/H^+} B \xrightarrow{NH_3} C$

PART - IV

Answer all the questions. **5 x 5 = 25**

34. a) i) Explain Zone refining process.
    ii) Give the limitations of Ellingham diagram. **(OR)**
    b) i) Write a note on zerolites.
    ii) What are the uses of borax?
35. a) i) Justify the position of lanthanoids and Actinoids in the periodic table.
    ii) What is lanthanoid contraction? **(OR)**
    b) Write the postulates of Werner's theory.
36. a) Explain Schottky defect and Frenkel defect with an example. **(OR)**
    b) i) Derive an expression for Ostwald's dilution law.
    ii) Define Kohlrausch's law.
37. a) Derive an expression for Nernst equation. **(OR)**
    b) i) Explain Lucas test differentiating 1^0, 2^0, 3^0 alcohols.
    ii) Explain Kolbe's reaction.
38. a) i) Explain the mechanism of aldol condensation.
    ii) Write about Clemension reduction. **(OR)**
    b) i) Write Gabriel phthalimide synthesis.
    ii) What are Hormones?