

Second PUC Preparatory Examination, January - 2014

Subject : CHEMISTRY

Time : 3 Hours 15 Min

Max. Marks : 70

Instructions:

- The question paper has four parts: A, B, C, and D. All parts are compulsory.
Write balanced chemical equations and draw labeled diagrams wherever required.
Use log tables and the simple calculator if necessary.
(Use of scientific calculators is not allowed)

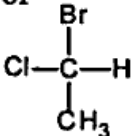
PART-A

I. Answer the following questions.

10x1=10

1. Between pure solvent and solution, which has higher vapour pressure.
2. What is osmotic pressure?
3. Name the gas liberated at anode when molten NaCl is electrolysed.
4. What is the order of the reaction given below:



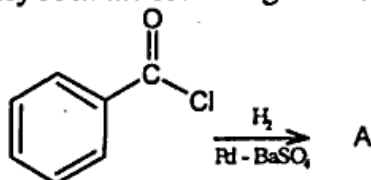
5. Give an example for shape selective catalysts.
6. Name the reducing agent used in the extraction of gold by leaching with NaCN.
7. Which noble gas has lowest boiling point?
8. Write the enantiomer of

9. What is the product formed when acetaldehyde is heated with Fehling's reagent?
10. Name the hormone responsible for the utilization of sugar in the body.

PART-B

II. Answer any five of the following questions.

5x2=10

11. Calculate the number of particles in a unit cell of BCC.
12. A solution of CuSO_4 is electrolysed for 10 minutes with a current of 1.5amp. what is the mass of copper deposited at the cathode? [1 mole of copper = 63g]
13. What is pseudo first order reaction? Give an example.
14. Name the 3d element which does not show variable oxidation states. Give its electronic configuration.
15. Vapours of ethanol are passed over heated copper at 573K. Give equation for the reaction and name the product.
16. Identify A in the following reaction and name the reaction.



17. Give an example for (i) food preservative (ii) antacid
18. How do you prepare soaps? Give equation.

PART-C

III. Answer any five of the following questions.

5x3=15

19. Write a neat labelled diagram of the electrolytic cell for the extraction of aluminium. Name is the electrolyte used. Give the overall reaction.

20. Explain the manufacture of ammonia by Haber's process.
21. How do you get oleum from sulphur trioxide? Write its composition. What do you get when oleum is diluted with water?
22. Why are interhalogen compounds more reactive than halogens? Name the interhalogen compound which is a gas at room temperature.
23. How do you prepare potassium dichromate from chromite ore?
24. Which among Fe^{+2} , Co^{+2} , Ni^{+2} , has more magnetic moment? calculate its magnetic moment.
25. For the complex $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]$, write the two geometrical isomers and mention the coordination number of Cobalt.
26. Give the geometry, hybridization and magnetic property of $[\text{Ni}(\text{CN})_4]^{2-}$ based on VBT.

PART-D

IV. Answer any three of the following questions. 3x5=15

27. (a) Calculate the packing efficiency in simple cubic lattice. 3
(b) Name any two types of crystal systems. 2
28. (a) A solution containing 1.25g of an organic solute in 50g of CCl_4 boils at 77.3°C . What is the molar mass of the solute. (B.P of pure solvent = 76.8°C , $K_b = 5.0 \text{ K kg mol}^{-1}$) 3
(b) Give any two applications of Henry's law. 2
29. (a) Using Nernst equation calculate emf of a cell $\text{Mg} | \text{Mg}^{+2}(0.13\text{M}) || \text{Ag}^+(0.0001\text{M}) | \text{Ag}$
 $E^\circ_{\text{cell}} = 3.17\text{V}$ 3
(b) Give the unit of molar conductivity and its relationship with conductivity. 2
30. (a) Derive the expression for the rate constant of a first order reaction. 3
(b) The rate constants of a reaction at 500K and 700K are 0.02s^{-1} and 0.07s^{-1} respectively. Calculate activation energy. [$R = 8.314\text{JK}^{-1}\text{mol}^{-1}$] 2
31. (a) Give any three differences between chemisorption and physisorption 3
(b) How do you prepare a metal sol by Bredig's Arc method? 2

IV. Answer any four of the following questions. 4x5=20

32. (a) Explain $\text{S}_{\text{N}}1$ mechanism with an example. 3
(b) What is the major product obtained when 2-bromopentane reacts with alcoholic KOH? Name the type of the reaction. 2
33. (a) What happens when ethanol reacts with acetic acid in presence of conc. H_2SO_4 ? What is the role of conc. H_2SO_4 ? <https://www.karnatakaboard.com> 3
(b) How do you get salicylic acid from phenol by Kolbe's reaction? Give equation. 2
34. (a) What type of aldehyde undergoes cannizzaro's reaction? Explain the reaction with an example. 3
(b) Give equation for the reaction of ammonia with acetic acid. 2
35. (a) What is Hinsberg reagent? How do you distinguish primary, secondary and tertiary amines using Hinsberg reagent? 3
(b) How do you get amines from amides? Give equation. 2
36. (a) Write the Haworth structure of sucrose. Why is it a non-reducing sugar? 3
(b) What do you mean by essential amino acid? Give an example. 2
37. (a) Write the monomer units for
(i) nylon 6,6 (ii) natural rubber 3
(b) What are thermoplastics? Give one example. 2
