

MODEL QUESTION PAPER –MARCH-2016

II – PUC CHEMISTRY (34)

Time: 3 hours 15 minutes

Maximum Marks: 70

Instructions:

1. The question paper has four parts: A, B, C and D. All parts are compulsory.
2. Write balanced chemical equations and draw labeled diagrams wherever required.
3. Use log tables and the simple calculators if necessary.

(Use of Scientific Calculator is not allowed)

PART- A

I. Answer ALL of the following. (Each question carries 1 mark)

10 × 1 = 10

1. What is the value of Van't-Hoff factor for weak acid which undergoes association in aqueous solution?
2. How does the size of blood cells change when placed in an aqueous solution containing more than 0.9% (m/v) sodium chloride?
3. The resistance of a conductivity cell containing 0.001M KCl solution at 298K is 1500Ω. What is the cell constant if conductivity of 0.001M KCl solution at 298K is $0.146 \times 10^{-3} \text{ Scm}^{-1}$?
4. What should be the minimum energy required by the reactants to undergo chemical reaction?
5. Which has higher enthalpy of adsorption, physisorption or chemisorption?
6. Name a carbonate ore of iron
7. Complete the following equation:
$$\text{XeF}_4 + \underline{\hspace{2cm}} \xrightarrow{143\text{K}} \text{Xe}_2\text{F}_6 + \text{O}_2$$
8. Give an example for a geminal halide
9. Which type of aldehydes **do not** undergo Cannizzaro's reaction?
10. What is the function of mineralocorticoids?

PART- B

II. Answer Any FIVE of the following. (Each question carries 2 mark)

5 × 2 = 10

11. Mention two types of motion of electrons which originates the magnetic moment of a substance.

12. Write anodic and cathodic reactions in a lead –acid battery, when in use.
13. What is the effect of catalyst on Gibbs energy and activation energy of a reaction?
14. How will you account for the following
 - i) Zr and Hf sizes are almost same.
 - ii) Actinides exhibit more number of oxidation states than lanthanides.
15. Explain Kolbe's reaction.
16. Name the reagent used to convert
 - i) ethanal to but-2-enal
 - ii) ketone to oxime
17. What are tranquilizers? Give an example for neurotransmitters.
18. Explain saponification with an example.

PART- C

III. Answer Any FIVE of the following. (Each question carries 3 mark)

5 × 3 = 15

19. i) Write the anodic and cathodic reactions take place in of Hall-Heroult electrolytic cell in the extraction of aluminium.
- ii) Name the metal refined by Mond's process.
20. Discuss the principle involved in the manufacture of ammonia by Haber's process along the with the chemical equation.
21. Give any three reasons for the anomalous behavior of oxygen.
22. i) What is aqua regia?
- ii) Write the structure of chlorous acid.
- iii) Complete the equation: $\text{Br}_2 + 5\text{F}_2(\text{excess}) \rightarrow \underline{\hspace{2cm}}$
23. i) Many copper(I) compounds are unstable in aqueous solution and undergo disproportionation. Explain
- ii) What are interstitial compounds?
24. Describe the manufacture of potassium dichromate from chromite ore.
25. Based on VBT, explain the formation of $[\text{Ni}(\text{CN})_4]^{2-}$.
26. i) Write the structure of decacarbonyldimanganese(0). [Give formula is $\text{Mn}_2(\text{CO})_{10}$].
- ii) What are homoleptic complexes? Give an example.

PART –D

IV. Answer Any THREE of the following. (Each question carries 5 mark)

3 × 5 = 15

27. a) Calculate the packing efficiency in a cubic close packed (ccp) structure. 3
- b) Metallic iron crystallizes in a particular type of cubic unit cell. The unit cell

edge length is 287pm. The density of iron is 7.87gcm^{-3} . How many iron atoms are there with in one unit cell? [Given: $N_A = 6.023 \times 10^{23}$, $M = 55.845\text{g mol}^{-1}$] 2

28. a) Addition of 0.643g of a compound to 50 mL of a liquid (density = 0.879g/mL) lowers the freezing point from 5.51°C to 5.03°C . Calculate the molar mass of the compound. (K_f for benzene = 5.12K Kg mol^{-1}) 3

b) Give any two differences between ideal and non-ideal solutions. 2

29. a) How long a current of 3 ampere has to be applied through a solution of silver nitrate to coat a metal surface with 0.42g silver (Atomic mass of Ag = 108) 3

b) Write any two factors affecting ionic conductance. 2

30. a) Derive integrated rate equation for a first order reaction. 4

b) Define collision frequency. 1

31. a) How does free energy and entropy changes during adsorption of a gas on a solid. 2

b) Give an example for shape selective catalyst which converts alcohols into gasoline. 1

c) What is coagulating value? The coagulating value of A and B will be 2.4×10^{-3} millimoles per litre and 1.2×10^{-2} millimoles per litre, which one has higher coagulating power? 2

V. Answer Any Four of the following. (Each question carries 5 mark) $4 \times 5 = 20$

32. a) Write S_N2 mechanism and 'give the order of this reaction. 3

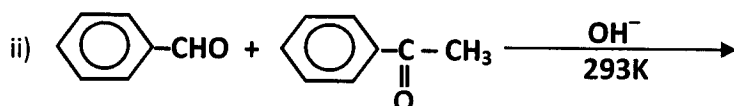
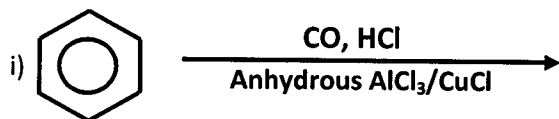
b) What are Grignard reagents? Write its general formula. 2

33. a) Explain the mechanism of hydration of alkenes to alcohols. 3

b) Explain Williamson's synthesis with an example. 2

34. a) Lower members of aldehydes and ketones are miscible with water. Give reason. 1

b) Complete the following reactions: 2



- c) Explain the effect of electron withdrawing group on acidity of carboxylic acid. 2
35. a) Write the IUPAC name of the product formed when aniline reacts with bromine water at room temperature and the equation for the reaction. 2
- b) Write in increasing order the base strengths of the following amines in aqueous solution $(C_2H_5)_3N$, $C_2H_5NH_2$, $(C_2H_5)_2NH$ 1
- c) How do you prepare benzene diazonium chloride by diazotization? Give equation 2
36. a) Write the Haworth structure of Maltose. 2
- b) What are fibrous proteins? Give an example. 2
- c) Name the base which forms hydrogen bond with adenine in double stranded helix structure of DNA. 1
37. a) Give the classification of polymers on the basis of their structure. 2
- b) How do you prepare Nylon-66? Give equation. 2
- c) Give an example of biodegradable polymer. 1
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NOTE: It is only a pattern of Question Paper