



JAIN COLLEGE

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Bengaluru - 560 098

Date: 2019-2020

SUBJECT: CHEMISTRY

IIPUC
MOCK II

Timings Allowed: 3 Hrs 15 min

Total 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 labelled diagram wherever required.
3. Use log tables and the simple calculator if necessary.

PART A

I Answer ALL the following

1 X 10 = 10

1. What is the effect of pressure on the solubility of a gas in a liquid?
2. Define reverse osmosis.
3. Write the half-cell reaction of SHE.
4. In a zero order reaction the time taken to reduce the concentration of reactant from 50% to 25% is 30 min. What is the time required to reduce the concentration from 25% to 12.5%?
5. Define sorption.
6. What is cast iron?
7. What is aqua regia?
8. Higher ketones like acetophenone do not react with NaHSO_3 . Give reason.
9. Name the reagent used for the conversion of alkyl halide to alkene
10. Which hormone regulates blood sugar level?

PART B

II Answer any FIVE of the following

2 X 5 = 10

11. What are ferromagnetic substances? Give an example.
12. Mention any two factors which affect the conductivity of electrolytic solution.
13. Write the energy distribution curve showing temperature dependence on rate of a reaction.
14. (a) Give any two reasons for the formation of large number of complex compounds by transition metals.
(b) Between Ti^{2+} and V^{2+} which ion contains more number of unpaired electrons?
15. What is the effect of
(i) Electron withdrawing group on acidity of phenols?
(ii) Electron donating groups on acidity of alcohols?
16. Explain decarboxylation reaction with an example.
17. Soaps do not work in hard water .Why?
18. What are anionic detergents? Give an example.

PART C

III Answer any FIVE of the following

3 X 5 = 15

19. Explain the reducing behaviour of carbon in the extraction of iron by using Ellingham diagram. 3
20. a) Write a note on froth floatation method of concentrating ores .
b) How is zinc extracted from its oxide? 2+1
21. (a) Which is the strongest among hydrogen halides? Give one reason($X=\text{F,Cl,I}$)
(b) Write the structure of Chlorous acid [HOClO] 2+1
22. (a) Complete the following reaction
(i) $\text{NO} + \text{O}_3 \rightarrow$
(ii) $\text{CH}_4 + 2\text{O}_2 \rightarrow$
(b) Fluorine exhibit only -1 oxidation state. 2+1
23. Explain the preparation of $\text{K}_2\text{Cr}_2\text{O}_7$ from chromite ore. 3

24. (a) Study of actinide elements is difficult. Give two reasons. 2+1
 (b) Write composition of bronze?
25. (a) Write the cis and trans isomers of $[\text{Fe}(\text{NH}_3)_2(\text{CN})_4]^-$ 2+1
 (b) What is the IUPAC name $[\text{Pt}(\text{NH}_3)_3(\text{H}_2\text{O})\text{Cl}_2]$.

PART D

IV Answer any THREE of the following

5 X 3 = 15

26. a) Explain ionization isomerism with an example. 2+1
 b) Give an example of a polydentate ligand.
27. (a) Calculate the packing efficiency in body centered cubic lattice. 2+1
 (b) An element having atomic mass 63.1 g/mol has face centered cubic unit cell with edge length 3.608×10^{-8} cm. Calculate the density of the unit cell. [Given $N_A = 6.022 \times 10^{23}$ atoms/mol]
28. (a) The boiling point of benzene is 353.23K when 1.80g of non-volatile, non-ionisable solute was dissolved in 90g of benzene the boiling point raised to 354.11K. Calculate the molar mass of the solute. [K_b for benzene = 2.53K kg/mol] 2+1
 (b) What is the value of van't Hoff factor i for association?
 (c) How does solubility of any gas vary with pressure? 3+1+1
29. (a) Find the value of ΔG° at 25°C for the following electrochemical cell $\text{Cu}|\text{Cu}^{2+} (1\text{M})||\text{Ag}^+(1\text{M})|\text{Ag}$
 $E^\circ_{\text{Ag}} = +0.80\text{V}$ $E^\circ_{\text{Cu}} = +0.34\text{V}$ Faraday = 96487C 3+2
 (b) Write the equation for anodic and cathodic reaction occurs during rusting of iron.
30. (a) Derive integrated rate equation for first order reaction. 3+2
 (b) 75% of the first order reaction is completed in 30min. Calculate rate constant of the reaction.
31. (a) Write a note on electrophoresis. 2+3
 (b) Give the mechanism of heterogenous catalysis.

PART E

V Answer any FOUR of the following

5 X 4 = 20

32. (a) Explain S_N2 mechanism with example. 3+2
 (b) How does chlorobenzene react with chlorine in presence of FeCl_3 catalyst?
33. (a) Explain Reimer-Tiemann reaction with example 2+2+1
 (b) How does anisole react with methyl chloride in presence of anhydrous AlCl_3 Catalyst?
 (c) Name enzyme used to convert glucose to ethyl alcohol?
34. (a) Explain cross aldol condensation with an example. 2+2+1
 (b) Explain what happens when carbonyl compounds are treated with hydrazine? Write the equation.
 (c) Give the IUPAC name of $\text{CH}_3\text{-CH}_2\text{-CHO}$.
35. (a) Explain the reduction of nitro compound to amine with example. 2+1+2
 (b) What is Hinsberg reagent?
 (c) How do you prepare iodobenzene from aniline?
36. (a) Write the Haworth structure of sucrose. 2+1+2
 (b) Name the water insoluble component of starch.
 (c) Give the reaction to show the presence of aldehyde functional group in glucose.
37. (a) Explain the preparation of terylene (Dacron) 2+2+1
 (b) What are condensation polymers? Give example.
 (c) Name the monomer present in Glyptal.
