



NS – 292

III Semester B.Sc. Examination, Nov./Dec. 2016
(NS – 2012-13 and Onwards) (Repeaters) (Prior to 2015-16)
CHEMISTRY (Paper – III)

Time : 3 Hours

Max. Marks : 70

Instructions : 1) The question paper has **two** Parts. Answer **both** the Parts.
2) Draw diagrams and write chemical equations **wherever** necessary.

PART – A

Answer **any eight** of the following questions. Each question carries **two** marks.
(8×2=16)

1. Define mean life period of a reaction. How is it related to rate constant rate constant of a second order reaction ?
2. Define the terms :
 - i) Collision frequency.
 - ii) Collision number
3. Explain Schottky defect.
4. What is Joule-Thomson effect ?
5. Define radius ratio.
6. Give any two differences between addition and condensation polymerisation.
7. How is salol prepared from phenol ?
8. Give reason "The plot of ΔG° versus T for the formation of CO from carbon is a downward slope.
9. How is primary alcohol prepared by hydroboration oxidation reaction ?
10. Write the general equation for the synthesis of glycerol from oils and fats.
11. How is styrene converted to styrene oxide (epoxide) ?
12. Why 'd' block elements are called transition metals ?

P.T.O.



PART - B

Answer any nine of the following questions. Each question carries six marks.

(9×6=54)

13. a) Derive an expression for rate constant of second order reaction when $[a]=[b]$.
b) Explain the effect of temperature on the rate of a reaction. (4+2)
14. a) Explain Lindemann's hypothesis of unimolecular reaction.
b) The half change time for a second order reaction is 25 minutes, when the initial concentration of the reactants is $0.018 \text{ mol dm}^{-3}$. Calculate the value of rate constant. (4+2)
15. a) Describe the determination of structure of sodium chloride by rotating crystal method.
b) State law of rational indices. (4+2)
16. a) Define: i) Axis of symmetry ii) Plane of symmetry.
b) Calculate the number of particles per unit cell in BCC type of crystal. (4+2)
17. a) Draw Andrew's isotherm for carbon dioxide, indicate critical temperature and explain its significance.
b) Calculate the most probable velocity of oxygen molecule at 273K ($R = 8.314 \text{ J/K/mol}$). (4+2)
18. a) Describe the experimental determination of T_c and P_c of a gas.
b) Give the principle involved in Mond's process for the refining of nickel. (4+2)
19. a) Explain the mechanism of oxidation of glycol by lead tetraacetate.
b) How is acetic acid converted to ethylalcohol? (4+2)
20. a) Explain the mechanism of Kolbe - Schmidt reaction.
b) Explain esterification reaction with a suitable example. (4+2)
21. a) Explain :
i) Transition metal ions form coloured compounds.
ii) Transition metals exhibit variable oxidation states.
b) What is lanthanide contraction? (4+2)



22. a) Explain the reactions of epoxide with
i) carbon nucleophile and
ii) nitrogen nucleophile with suitable examples.
b) Why are organolithium compounds more reactive than Grignard reagents? (4+2)
23. a) Describe the extraction of thorium from monazite sand.
b) Give two applications of Ellingham diagrams. (4+2)
24. a) How are the following synthesised?
i) Neoprene
ii) Polyvinyl chloride
b) Give any two differences between inorganic and organic polymers. (4+2)
25. a) How are the following conversions effected?
i) Methyl magnesium iodide to acetic acid.
ii) Methyl magnesium iodide to methane.
b) Give the general outer electronic configuration of 'd' and 'f' block elements. (4+2)
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