



UN – 341

III Semester B.Sc. Examination, November/December 2015  
(Semester Scheme)  
(NS) (2012-13 and Onwards)  
CHEMISTRY – III

Time : 3 Hours

Max. Marks : 70

**Instruction :** The question paper has **two** Parts. Answer **both** the Parts.

PART – A

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

1. What is Joule-Thomson effect ?
2. Define radius ratio.
3. What is Vulcanization of rubber ?
4. What are Thiols ? Give their general formula.
5. Carboxylic acids are more acidic than phenol. Why ?
6. Explain Schottky defect.
7. Define :
  - i) Mean free path
  - ii) Collision frequency.
8. d-block elements readily form complexes ? Give reason.
9. Why are organolithium compounds more reactive than Grignard reagents ?
10. Write the expression for the velocity constant of a first order reaction and mention its unit.
11. What is meant by energy of activation ?
12. Give reason "The plot of  $\Delta G^\circ / V_s T$  for the formation of CO from carbon is a slop downwards to x-axis".

PART – B

Answer **any nine** of the following questions. Each question carries **six** marks. (9×6=54)

13. a) Derive an expression for the velocity constant of second order reaction when  $a = b$ .  
b) Describe the half life method for determining order of a reaction. (4+2)

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14. a) Describe Linde's process for the liquefaction of air.  
b) Calculate the most probable velocity of  $O_2$  at STP. (4+2)
15. a) How is Thorium extracted from monazite sand ?  
b) What is an Ellingham's diagram ? (4+2)
16. a) Describe the experimental determination of  $T_c$  and  $P_c$  of a gas.  
b) Define inversion temperature. (4+2)
17. a) Explain Lindemann's theory for unimolecular reaction.  
b) For a reaction the values of rate constants at 298K and 338K were  $3.46 \times 10^{-5} \text{ s}^{-1}$  and  $4.81 \times 10^{-3} \text{ s}^{-1}$  respectively. Calculate the energy of activation.  
(Given  $R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$ ) (4+2)
18. a) Describe the determination of structure of NaCl by rotating crystals method.  
b) What are F-centres ? (4+2)
19. a) Derive Bragg's equation.  
b) Write a note on gem stones. (4+2)
20. a) Explain the types of polymerisation with suitable example.  
b) Give two difference between inorganic polymer and organic polymer. (4+2)
21. a) Explain the following properties of d-block elements.  
i) Variable oxidation states  
ii) Formation of interstitial compounds.  
b) Why are f-block elements called the inner transition elements ? (4+2)
22. a) How are Lanthanides separated by ion exchange method ?  
b) How is propan-2-ol obtained from methyl magnesium iodide ? (4+2)
23. a) Explain Lucas test to distinguish between primary, secondary and tertiary alcohols.  
b) What happens when glycerol is heated with conc.  $H_2SO_4$  ? (4+2)
24. a) What are glycols ? How does ethylene glycol react with periodic acid ? Give equation.  
b) Explain Williamson's ether synthesis with an example. (4+2)
25. a) Explain the mechanism of Reimer-Teimann reaction.  
b) How is an epoxide prepared from peroxy benzoic acid ? (4+2)