



I Semester B.Sc. Examination, Nov./Dec. 2016  
(Semester Scheme) (CBCS) (F + R)  
(2014-15 and Onwards)  
CHEMISTRY – I

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.

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Answer **any eight** of the following questions. Each question carries **two** marks. (8x2=16)

1. Define the term Joule-Thomson co-efficient.
2. What are chemical sensors ? Give an example.
3. State law of corresponding states.
4. Differentiate  $\sin x$  with respect to  $x$ .
5. The radius of cation is smaller than the corresponding atom. Explain.
6. Define critical solution temperature.
7. What is azeotropic mixture ? Give an example.
8. What is Diagonal relationship ? Give example.
9. How is alkene converted to an alcohol by hydroboration reaction ?
10. What are cycloalkanes ? Give an example.
11. Calculate the equivalent mass of NaOH (Atomic weight of Na = 1, O = 16, H = 1).
12. What are Electrophiles ? Give examples.



## PART - B

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

13. a) Integrate :
- Cos  $x$  w.r.t.  $x$
  - Differentiate  $\sqrt{x}$ .
- b) What is photosensitization ? Give an example.
14. a) Describe Landsberger's method of determination of molecular mass of a solute.
- b) Explain the principle involved in steam distillation.
15. a) Describe Linde's process for the liquifaction of air.
- b) Define average velocity of a gas.
16. a) Explain the terms fluorescence and phosphorescence.
- b) State Beer-Lamberts law.
17. a) Describe the experimental determination of critical volume by Amagat's mean density method.
- b) Calculate the root mean square velocity of oxygen molecule at 300 K [M<sub>O<sub>2</sub></sub> = 32 × 10<sup>-3</sup> kg, R = 8.314 JK<sup>-1</sup> mol<sup>-1</sup>].
18. a) Explain the mechanism of anti-Markownikov's addition reaction with an example.
- b) What is Diels-Alder reaction ? Give an example.
19. a) Define the term electron affinity. Explain the variation of electron affinity across a period and down a group in periodic table.
- b) What is electronegativity of an element ?
20. a) Write Sugden equation. Indicate the terms.
- b) Write the 3 types of dienes with an example for each type.
21. a) Define surface tension. How does the surface tension of a liquid vary with temperature ?
- b) 0.36 gram of non volatile solute when dissolved in 25.5 gram of benzene lowered the freezing point of benzene by 0.42 K 96°, K<sub>f</sub> for benzene is 5.15 K kg mol<sup>-1</sup>. Calculate the molar mass of the solute.



22. a) Compare the reactivities of carbonates of Alkali and Alkaline earth metals with an example for each.
- b) Name the factors affecting the Ionisation energy. (4+2)
23. a) Discuss homolytic fission and heterolytic fission with an example for each.
- b) What are carbenes ? Give an example. (4+2)
24. a) Explain the mechanism of ozonolysis and mention its importance.
- b) How alkanes are prepared by Corey-House method ? (4+2)
25. a) Define the terms :
- i) Accuracy
  - ii) Precision
  - iii) Significant figures
  - iv) Errors.
- b) Calculate the normality of a solution containing 1.225 gram of potassium dichromate in 250 cm<sup>3</sup> of solution (Equivalent weight of K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> = 49). (4+2)

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