

I Semester B.Sc. Examination, November/December 2017
(CBCS) (2014-15 and Onwards) (F+R)
CHEMISTRY (Paper – I)

Time : 3 Hours

Max. Marks : 70

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

PART – A

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

1. What are exact and inexact differentials ?
2. Differentiate $\log \sin X$ with respect to X .
3. Calculate RMS velocity of SO_2 at 300 K. (Molecular weight of $\text{SO}_2 = 64 \times 10^{-3} \text{ kg}$, $R = 8.314 \times 10^{-3} \text{ KJK}^{-1} \text{ mol}^{-1}$)
4. Define Collision number of gas molecules.
5. What are the differences between Thermal and photochemical reactions ?
6. What is the principle of fractional distillation ?
7. Write Sugden equation. Indicate the terms.
8. State Nernst distribution law.
9. Define the term ionisation potential.
10. What is meant by diagonal relationship ? Give examples.
11. Define Accuracy and Precision.
12. Explain Corey-House reaction with an example.



PART - B

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

13. a) Explain Cagniard de La Tour's method of determining critical temperature and critical pressure of a gas. (4+2)
b) Differentiate $\cos^{-1} X$ with respect to X .
14. a) Derive an expression for the most probable velocity from Maxwell-Boltzmann distribution of velocities in a gas. (4+2)
b) State the law of corresponding states.
15. a) Describe in detail Andrew's experiment on carbon dioxide. (4+2)
b) What is Joule-Thomson effect?
16. a) State the laws of photochemistry. (4+2)
b) What is Bioluminescence? Give one example.
17. a) Explain Beckmann's method for the determination of molecular mass of a solute. (4+2)
b) Write a short note on chemical sensors.
18. a) Define the following terms and explain the effect of temperature : (4+2)
i) Surface tension
ii) Viscosity.
b) What are Azeotropic mixtures? Give an example.
19. a) The boiling point of chloroform was raised by 0.325 K, when 5.141 g of anthracene was dissolved in 35 g of chloroform. Calculate the molar mass of Anthracene. (K_b for chloroform is 3.9). (3+3)
b) How do you determine the electronegativity of an element from Pauling's method?
20. a) Discuss the properties of group 2 elements with reference to (4+2)
i) their reaction with halogens
ii) thermal stability of their carbonates.
b) State Modern Periodic Law.

1. a) Define atomic radius of an atom. Explain how it varies in the periodic table.
b) Calculate the normality of a solution containing 1.53 g of sodium carbonate dissolved in 250 cm³ of water. (Atomic mass of Na = 23, O = 16, C = 12) (4+2)
2. a) What are significant figures? Give example.
b) How do you minimize the determinate errors? (2+2+2)
c) State Markownikoff's rule.
23. a) What are Carbocations? Explain the stability and reactivity of free radicals on the basis of Inductive effect and hyperconjugation effect. (4+2)
b) What are electrophiles? Give example.
24. a) Write a note on Baeyer's strain theory of cycloalkanes. Give its limitations.
b) Draw chair and boat forms of cyclohexane. Among the both which form is more stable. (4+2)
25. a) How do you prepare Alkenes by Wittig reaction?
b) Explain Diels Alder reaction with an example. (2+2+2)
c) Write a note on ozonolysis reaction for alkenes.