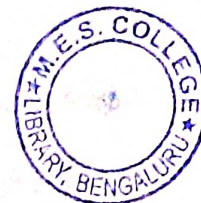


SN – 333

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.

P.T.O.



PART – B

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

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



21. 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 cm^3 of water. (Atomic mass of Na = 23, O = 16, C = 12) (4+2)
22. a) What are significant figures ? Give example.
b) How do you minimize the determinate errors ?
c) State Markownikoff's rule. (2+2+2)
23. a) What are Carbocations ? Explain the stability and reactivity of free radicals on the basis of Inductive effect and hyperconjugation effect.
b) What are electrophiles ? Give example. (4+2)
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.
c) Write a note on ozonolysis reaction for alkenes. (2+2+2)
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