QP – 224

I Semester B.Sc. Examination, April/May 2021
(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.*

PART – A

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

1. Write the conditions for maxima and minima of a function.
2. Define critical temperature.
3. Calculate the RMS velocity of methane molecule at 400 K. (Given R = 8.314 J/K/m)
4. State Stark-Einstein Law of photo chemistry.
5. Write Sugden equation and indicate the terms in it.
6. Lithium is most powerful reducing agent, Why ?
7. What are chalcogens ? Write their general electronic configuration.
8. Discuss the basicity of alkali hydroxides.
9. Define i) Accuracy ii) Precision.
10. What are electrophiles ? Give an example.
11. Explain optical isomerism with an example.
12. Write any two limitations of Baeyer's strain theory.

PART – B

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

13. a) i) Find the value of log 125, if log 5 = 0.6990.
    ii) Differentiate e^x with respect to x.
    b) Write any two applications of solvent extraction. **(4+2)**
14. a) Describe Andrew's experiment on Carbon dioxide.
    b) What is most probable velocity ? Write the expression to calculate most probable velocity. **(4+2)**

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15. a) How critical temperature and critical pressure are determined experimentally ?
    b) Calculate critical pressure of the gas. (Given a = 0.367 Nm^4/mol^2, b = 0.0408×10^{-3} m^3/mol) **(4+2)**

16. a) Give any four differences between photochemical and thermochemical reactions.
    b) Write a short note on photosensitisers. **(4+2)**

17. a) How do you determine molar mass of a solute by Landsberger's method ?
    b) What is vant Hoff's factor ? **(4+2)**

18. a) Write mathematical expression for viscosity of liquid and explain the factors affecting viscosity of a liquid.
    b) Explain the principle involved in steam distillation. **(4+2)**

19. a) Define surface tension. How does the surface tension of a liquid vary with temperature ?
    b) What are Carbenes ? Give an example. **(4+2)**

20. a) Write a note on determinate and indeterminate errors.
    b) State Beer-Lambert's law. **(4+2)**

21. a) How is Electronegativity calculated from Pauling's method ?
    b) What are free radicals ? How are they generated ? **(4+2)**

22. a) Define Ionisation energy. How does it vary along a period and down the group in periodic table ?
    b) What are isoelectronic ions ? Give an example. **(4+2)**

23. a) Discuss Homolytic and Heterolytic fission with an example for each.
    b) State modern periodic law. **(4+2)**

24. a) State anti Markownikoff's rule. Explain with an example.
    b) How do you prepare alkenes by Wittig's method ? **(4+2)**

25. a) How alkynes are synthesised by dehydrohalogenation of
        i) Vicinal dihalides.
        ii) Geminal dihalides.
    b) Draw Newmann's conformers for n-butane. **(4+2)**
