SN – 239

I Semester B.Sc. Examination, November/December 2014
(Fresh) (CBCS)
(2014-15 & Onwards)
CHEMISTRY – I

e : 3 Hours | Max. Marks : 70

Instructions : *1) The question paper has **two** Parts.*
*2) Answer **both** the Parts.*

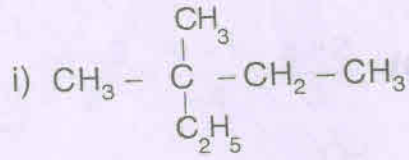
PART – A

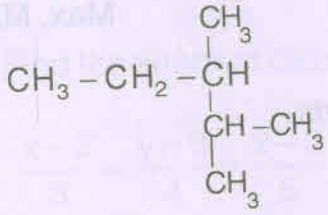
nswer **any eight** of the following questions. **Each** question carries **two** marks. **(8×2=16)**

1. Write an expression for mean free path of molecules in a gas.
2. Log 2 = 0.301, calculate the value of log 16.
3. Define the term collision frequency of molecules in a gas.
4. What is photosensitization ? Give an example.
5. Explain the principle of steam distillation.
6. State Grotthus-Draper law.
7. Define the term osmotic pressure of a solution.
8. Define the term electron affinity of an element.
9. Explain the variation in ionisation energy across a period.
10. What are determinate errors ? Mention different types of it.
11. What are nucleophiles ? Give examples.

P.T.O.

12. Write the IUPAC names of :

i) 

ii) 

PART – B

Answer **any nine** of the following questions. **Each** question carries **six** marks.

13. a) Describe the experimental determination of critical temperature and critical pressure of a gas.
    b) Define root mean square velocity of molecules in a gas.

14. a) State the law of corresponding states.
    b) Write the reduced equation of state for a gas.
    c) Evaluate $\int 1/x^2 \, dx$.

15. a) Explain the terms fluorescence and phosphorescence with an example each.
    b) Give any two differences between thermal and photochemical reactions.

16. a) Describe Landsberger's method of determination of molecular mass of a non-volatile solute.
    b) Define molal elevation constant. Mention its unit.

17. a) Calculate the elevation in boiling point of one molal solution. ($K_b = 0.52$ K kg mol^{-1})
    b) Write the Sugden's equation for parachor of a substance and mention the terms in it.
    c) State Nernst distribution law.

18. a) Define the term electronegativity of an element. How is it calculated by the Pauling's method ?

b) Between Na^{+} and Al^{+3}, which is smaller in size and why ? (4+2)

19. a) Define atomic radius. Explain the variation of atomic radius across a period and down the group.

b) Halogens have relatively high values of electron affinity. Explain. (4+2)

20. a) Explain Sachse-Mohr theory of strainless rings taking cyclohexane as an example.

b) Write the structures of geometrical isomers of 2-butene. (4+2)

21. a) Draw the Newmann's projection formulae of different conformations of n-butane and mention which form is more stable.

b) Explain Wurtz reaction with a suitable example. (4+2)

22. a) What are carbenes ? Give an example.

b) Give the reaction of 1, 2-dibromoethane with alcoholic KOH solution.

c) Calculate the angle strain in cyclopentane. (2+2+2)

23. a) Differentiate e^{x} with respect to x.

b) What are constant boiling mixtures ? Give an example.

c) Write a note on diagonal relationship in the periodic table. (2+2+2)

24. a) What are significant figures in a numerical expression ?

b) Calculate the equivalent mass of H_2SO_4. (atomic masses of H = 1, S = 32 and O = 16).

c) Define equivalent weight of a base. (2+2+2)

25. a) Explain chain isomerism with an example.

b) How is an alkane prepared by Corey-House method ?

c) Give an example for anti-Markownikoff addition. (2+2+2)