SS – 327

I Semester B.Sc. Examination, November/December 2018
(2014-15 and Onwards) (F + R) (CBCS)
Paper – I : CHEMISTRY

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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. Find the value of log 25, if log 5 = 0.6990.
2. Give the relationship between Van der Waal's constants and critical pressure of a gas. Mention its SI units.
3. What is inversion temperature ?
4. State Stark-Einstein law.
5. Define critical solution temperature of a partially miscible liquid mixture.
6. Atomic radius decreases across a period. Give reasons.
7. Define electron affinity.
8. Give any two important chemical properties of Alkali metals.
9. What is a dibasic acid ? Give an example.
10. Classify the following into electrophiles and nucleophiles BF_3, NH_3, $-CN$, $-{}^{\oplus}NO_2$
11. How cycloalkane is synthesised from benzene ?
12. Mention any two important limitations of Bayer's strain theory.

P.T.O.

PART – B

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

13. a) Write Maxwell-Boltzmann distribution law of molecular velocities and explain the terms involved.

    b) Define exact differential. Give an example. **(4+2)**

14. a) Derive an expression for critical volume of a gas from Van der Waal's equation.

    b) Calculate the rms velocity of methane molecule at 400 K. Given, molar mass = 16×10^{-3} kg mol^{-1}, R = 8.314 JK^{-1} mol^{-1}. **(4+2)**

15. a) Explain briefly Andrew's experiments on Carbon dioxide.

    b) Give the principle of liquifaction of air by Linde's process. **(4+2)**

16. a) State and explain Beer-Lambert's law. Mention any two of its applications.

    b) Give any two examples for (i) Chemical sensors (ii) Photosensitisers. **(4+2)**

17. a) Mention any four differences between ideal and non ideal solutions.

    b) Define normality of a solution. Give an example. **(4+2)**

18. a) Discuss Berkeley-Hartley's method of measurement of osmotic pressure of a solution.

    b) What is surface tension ? Mention its SI Units. **(4+2)**

19. a) State and explain Nernst distribution law briefly.

    b) Explain Corey-House synthesis with an example. **(3+3)**

20. a) Discuss variation of ionisation energy (i) across a period (ii) down the group.

    b) What is diagonal relationship ? Give an example. **(4+2)**

21. a) Explain the formation of oxides and carbonates of alkaline earth elements.

    b) Give any two applications of electronegativity. **(4+2)**

22. a) Calculate the normality of
    i) $KMnO_4$ solution, when 25 cm^3 of 0.09 N sodium oxalate solution reacts completely with 24.4 cm^3 of $KMnO_4$ solution.
    ii) 4.92 g of Ferrous ammonium sulphate crystals dissolved in water and made up to 250 cm^3 solution. (Eq. wt. mass of FAS = 392.14)

    b) What are indeterminate errors ? Give an example. (4+2)

23. a) Explain the stability of carbocations based on inductive effect.

    b) Explain hyper conjugation with an example. (4+2)

24. a) How alkynes are synthesised by dehydrohalogenation of
    i) Vicinal dihalides
    ii) Geminal dihalides.

    b) What is wurtz reaction ? Give an example. (4+2)

25. a) Explain the mechanism of ozonolysis of alkenes.

    b) Draw any two conformations of n-butane according to Newman projection formula. (4+2)
