UG(1) — Ch (Sub /

Gen) New

2017

Time : 3 hours

Full Marks : 75

Pass Marks :23

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer **five** questions, selecting at least **one** from each Group, in which Q. No. 1 is compulsory.

1. Explain any **three** of the following :   5×3 = 15

   (a) Molecular Velocities are function of temperature and molecular mass

   (b) Faster reactions have lower activation energy

   (c) Trimethyl amine is weaker base than diethyl amine

   (d) Benzene does not possess any dipole moment

   (e) Isotopes are produced by the emission of β-particles from radio-active elements.

Group – A

2. (a) Define order and molecularity of reactions.

   (b) Find out expression for rate constant of first order reactions.

   (c) Deduce expression for half life period of first order reactions.   4+8+3 = 15

3. (a) Write down postulates of kinetic theory of gases.

   (b) Derive the kinetic gas equation :

   $$PV = \frac{1}{3} mnc^2.$$ 5+10 = 15

4. Write notes on any **three** of the following :

   5×3 = 15

   (a) Emulsions and gels

   (b) Le Chatelier's principle

   (c) Hardy-Schulze rule

   (d) Lyophilic and Lyophobic Colloids

Group – B

5. (a) Define isotope, isobar and isotone with examples.

   (b) Discuss Pauli's exclusion principle and Hund's rule.   7+8 = 15

6. How do (i) atomic radii (ii) ionisation potential (iii) Electron affinity, vary in groups and periods of the Periodic table.   5+5+5 = 15

7. Write notes on any **three** of the following :

                                                        5×3 = 15

   (a) Transition elements

   (b) VSEPR theory

   (c) Metallic bond

   (d) Fazan's rule

Group – C

8. (a) Discuss inductive effect and its consequences.

   (b) What is mesomeric effect ? Explain.

                                        $7\frac{1}{2}+7\frac{1}{2}$ = 15

KF – 99/1   (3)   (Turn over)

9. Explain any **three** of the following :   5×3 = 15

   (a) Methyl amine is stronger base than aniline

   (b) Trichloroacetaldehyde undergoes Cannizzaro reaction

   (c) Formaldehyde gives Silver mirror test

   (d) Chlroacetic acid is stronger than acetic acid

   (e) Acetylene undergoes substitution reactions

10. Write notes on any **three** of the following :

                                                        5×3 = 15

   (a) Free radical substitution reactions

   (b) Carbonium ion and Carbanion

   (c) Synthesis of urea

   (d) Hybridisation

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