Chemistry (Sub./Gen.)

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

1. Explain any three of the following : LNMUonline.com
   (a) Ionisation potential of Nitrogen is higher than oxygen.
   (b) Lyophilic solutions are more stable than lyophobic solutions.
   (c) $K_P = K_C$ for the reaction : $2HI = H_2 + I_2$.
   (d) Aniline is weaker base than methyl amine.
   (e) One a and two b-particles emited from a radioactive element result in production of isotope.

Group-A

2. (a) Write down postulates of Kinetic theory of gases.
   (b) Establish Kinetic gas equation : $PV = 1/3 \, mnc^2$.

3. (a) Derive an expression for first order rate constant.
   (b) Derive half life period of first order reaction.

4. Write notes on any three of the following :
   (a) Gold number
   (b) Lyophilic and lyophobic colloids
   (c) Dialysis
   (d) Tyndall effect

Group-B

5. (a) Explain isotopes, isobars and isotones.
   (b) State and explain Moseley's law.

6. Answer any two of the following :
   (a) Explain hybridisation.
   (b) Find out shape and structrue of CCl_4, BF_3, SF_6 and SO_4^{--}
   (c) Compare bond angles in CH_4, NH_3 and H_2O molecules.

7. Explain any two of the following :
   (a) Fajan's rule
   (b) H_2S is gas and H_2O is liquid at room temperature.
   (c) SF_6 molecule is octahedral in shape.

Group-C

8. Explain any three of the following :
   (a) Methyl amine is stronger base than ammonia.

   (b) Acetylene undergoes both addition and substitution reactions.
   (c) Chloroacetic acid is stronger than acetic acid.
   (d) Acetaldehyde gives silver mirror test.
   (e) Benzaldehyde undergoes Cannizzaro reaction.

9. (a) Outline the synthesis of glycerol.
   (b) How does glycerol react with any two of the following ?
   (i) Nitric acid (ii) PCl_5 (iii) Oxalic acid (iv) $KHSO_4$

10. Write notes on any three of the following :
    (a) Mesomeric effect   LNMUonline.com
    (b) Hyperconjugation
    (c) Homolytic and Heterolytic fission
    (d) Hofmann bromamide reaction
    (e) Inductive effect