

22231

21222

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--	--

15 minutes extra for each hour

- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following :

2 × 5 = 10

- (a) Define chemical kinetics (Reaction kinetics) and its use.
- (b) Give classification of chemical industry based on applications.
- (c) Enlist unsafe conditions in a laboratory.
- (d) Draw hazard symbol for flammable and toxic material.
- (e) Define specific gravity.
- (f) State Dalton's law.
- (g) Define Refractive index.

2. Attempt any THREE of the following :

4 × 3 = 12

- (a) Give the relation between chemical kinetics and thermodynamics.
- (b) Explain first-aid measures in case of eye injury and in case of skin burn.
- (c) 4 grams of NaOH are dissolved in water to obtain 100 ml solution. Find the normality and molarity of the solution.
- (d) Write applications of electrical conductivity measurement (Any four).

3. Attempt any THREE of the following :**4 × 3 = 12**

- (a) Write the formula for weight % and mole %.
- (b) Sodium chloride weighing 300 kg is mixed with 600 kg Potassium chloride.
Find the composition of mixture in (i) weight % and (ii) mole %.
- (c) Explain construction & working of pH meter.
- (d) Draw symbols of :
 - (i) Centrifugal pump
 - (ii) Tray drier
 - (iii) Evaporator
 - (iv) Spray column

4. Attempt any THREE of the following :**4 × 3 = 12**

- (a) Give the classification of Chemical Reactors.
- (b) State requirements of exit routes and assembly points.
- (c) Explain importance of safety in chemical industry.
- (d) Spent acid from a nitrating plant contains 35% HNO_3 , 35% H_2SO_4 and 30% water by weight. Express the composition in mole %.
- (e) Enlist different unit processes used in chemical industry (any four). Explain nitration reaction of phenol.

5. Attempt any TWO of the following :**6 × 2 = 12**

- (a) Explain principle, construction and working of Abbe Refractometer.
- (b) Name the operations used for separating solid-liquid mixture. Explain any one in detail.
- (c) Explain the principle of :
 - (i) Adsorption
 - (ii) Leaching
 - (iii) Distillation
 - (iv) Sedimentation

6. Attempt any TWO of the following :

6 × 2 = 12

- (a) Explain principle, construction and working of Electrical Conductivity Meter.
 - (b) Give the reasons for carrying out size reduction in chemical industry. Explain crushing operation.
 - (c) Write the following reactions :
 - (i) Preparation of ethane from ethylene
 - (ii) Preparation of ethyl acetate from acetic acid and ethyl alcohol.
-

