312341

12425

03 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

a) Give the classification of chemical industry based on the type of chemical manufactured.

b) Give the hazard symbol of :

i) Biohazard

ii) Toxic hazard

c) Define the following term :

i) Molarity

ii) Normality

d) Define pH of a solution.

e) Name any two operations used for the separation of solid-liquid mixture.

Marks

f) Define the following term :

i) Malleability

ii) Ductility

g) Name any two corrosion resistance materials.

2. Attempt any THREE of the following : **12**

a) Give the classification of chemical industry based on the type of product manufactured (any four) Name one company each producing the same.

b) Explain fire triangle in detail.

c) A mixture contains 200 gm NaOH, 300 gm NaCl and 500 gm Na_2CO_3. Express the composition of mixture by –

i) weight

ii) mole

d) Explain the procedure to measure specific gravity using specific gravity bottle.

3. Attempt any THREE of the following : **12**

a) Explain the job roles available to chemical engineers.

b) Explain the first aid measures in chemical laboratory for :

i) Eye Injury

ii) Inhalation of toxic fumes.

c) Name the operation used for size separation. Explain in detail (any one)

d) Give the applications of the following in process industries.

i) Carbon steel

ii) Stainless steel

Marks

4. Attempt any THREE of the following : **12**

a) Draw the PPE used for the protection of :

i) Ear

ii) Hand

iii) Safety Goggle

iv) Apron

b) Explain sulphonation with chemical reaction.

c) Give the principle by which size reduction is achieved. Also name equipment using these principles.

d) Explain the criteria for selecting material of construction.

e) Give the applications of the following materials of construction in process industries.

i) (LDPE) Low Density Polyethylene

ii) (HDPE) High Density Polyethylene

5. Attempt any TWO of the following : **12**

a) 200 gms NaOH is dissolved in water to prepare 1500 ml solution. Calculate its molarity and normality.

b) Define the following term :

i) Partial pressure

ii) Vapour pressure

iii) Dry bulb temperature

iv) Wet bulb temperature

v) Viscosity

vi) Electrical conductivity

c) Explain the following in detail –

i) Evaporation

ii) Distillation

Marks

6. Attempt any TWO of the following : **12**

a) Explain the procedure to prepare 500 ml 1N NaOH solution.

b) Explain with examples the following processes.

i) Oxidation

ii) Reduction

iii) Nitration

c) Explain the following –

i) Modes of heat transfer with examples

ii) Crystallization
