17325

11819

3 Hours / 100 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****.*

Marks

1. Attempt **any ten** of the following : **20**

a) Convert 2000 grams into kilograms.

b) Draw symbol of ribon blendor.

c) Write name of two oxidising agents.

d) Define 'conversion'.

e) Draw neat labeled figure of mercury in glass thermometer.

f) List any four types of chemical industries.

g) Write only the statement of Bond's law.

h) Define 'pyrolysis'.

i) What is size reduction operation ? Where it is used ?

j) Define 'yield'.

k) List any four temperature scales.

l) Define 'vapour pressure'.

m) Define "Esterification process".

2. Attempt **any four** of the following : **16**

a) How many moles of K_2CO_3 will contain 117 kg of K ?

b) What is sedimentation ? Give its examples. Draw symbol of thickner.

c) What is 'block diagram' ? Give its three uses.

P.T.O.

Marks

d) Explain with neat figure the pressure scales.

e) Define the following terms with examples :

i) Atomic weight

ii) Molecular weight.

f) What is distillation ? Draw neat labelled symbol for simple distillation set up.

3. Attempt **any four** of the following : **16**

a) Find the equivalent weight of the following :

i) NaOH

ii) Na_2CO_3

b) What is drying ? Give its two applications. Draw symbol for batch tray drying.

c) Explain sulphonation reaction with example. Write one name of sulphonating agent.

d) Write down any four properties and uses of nitric acid.

e) 98 grams of sulphuric acid (H_2SO_4) are dissolved in water to prepare one litre of solution. Find normality and molarity of solution.

f) Write four points of differentiation between the Jaw crusher and Gyratory crusher.

4. Attempt **any four** of the following : **16**

a) Prove that sum of mole fraction of components present in the binary system is equal to unity i.e.

$$\sum_{i=1}^{n} X_i = 1.0$$

b) A certain crusher accepts a feed material having a volume-surface mean diameter of 19 mm and gives a product of volume-surface mean diameter of 5 mm. The power required to crush 15 tonnes per hour is 7.5 kW. What will be the power consumption if the capacity is reduced to 12 tonnes per hour ?

c) Explain with example the chlorination reaction. Write one name of chlorinating agent.

d) Explain the process of concentration of nitric acid with neat labelled diagram.

e) Explain with neat figure the working of inclined leg manometer.

f) Define the following terms :

i) Equivalent weight

ii) Normality.

Marks

5. Attempt **any four** of the following : **16**

a) Find out the molarity, normality and molality of a 15% solution of sulphuric acid (H_2SO_4) having the density of 1.10 g/ml.

b) What are the essential components of a system used for conveying fluids in industry ? Draw the symbol of centrifugal pump and give its two applications.

c) Explain with neat figure the working of bob and tape method for measurement of liquid level.

d) Draw process flowsheet for manufacturing of commercial grade 98% sulphuric acid.

e) State Dalton's law and Amagat's law.

f) Explain with neat figure the working of Redwood viscometer.

6. Attempt **any four** of the following : **16**

a) An aqueous solution of sodium chloride (NaCl) is prepared by dissolving 25 kg of NaCl in 100 kg of water. Find weight % and mole % composition of solution.

b) Explain the principle of liquid-liquid mixing with neat labelled diagram.

c) Explain hydrogenation reaction with suitable example.

d) Explain with neat figure the working of sight glass method for measurement of liquid level.

e) Write down the reaction involved in manufacturing of nitric acid. Write any one catalyst used for this reaction.

f) Draw neat labelled figure of rotameter. Write its working.
