17206

16117

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) Define normality and molarity.

b) Define Dalton's Law with it's mathematical expression.

c) Name any four unit operations.

d) List any four personal protective equipments used in chemical industry.

e) Write different temperature scales used to measure temperature.

f) Give names of any four chemical industries.

g) What is conversion ? Write it's formula.

h) List any four uses of sulfuric acid.

i) Define hydrogenation and oxidation with suitable example of reactions.

j) Draw the symbol of centrifugal pump and ball mill.

k) Draw the diagram of Rotameter.

l) Write the names of two equipments used for solid mixing.

Marks

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

a) How will you prepare 1 N, 2 lit solution of NaOH ? (Atomic wt. Na = 23, O = 16, H = 1)

b) Write two names of each of the following industries -

(i) Large scale petroleum industry

(ii) Small scale chemical industry.

c) Draw the diagram of U-tube manometer.

d) Define the following:

(i) Size reduction

(ii) Size separation

(iii) Sedimentation

(iv) Filtration

e) Explain :

(i) Absorption

(ii) Drying with suitable example

f) Draw the symbol for :

(i) Packed column

(ii) Jaw crusher

(iii) Plate column

(iv) Screen

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

a) Define :

(i) Molecular weight

(ii) Equivalent wt.

(iii) Gram mole

(iv) Gram Equivalent

b) What is Amagat's Law ? Give it's mathematical statement. Also define vapor pressure.

c) Convert 0.6 gm/cm^3 into kg/m^3.

Marks

d) What are different modes of heat transfer ? Explain any one with suitable example.

e) Explain :

(i) Sulfonation

(ii) Nitration with suitable examples.

f) Draw the process flow sheet for the manufacturing of Nitric Acid.

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

a) State the working principle of filtration and sedimentation. Give one application of each operation.

b) Find the molarity and normality of 15% by wt. H_2SO_4 solution ? (Given ρ = 1.10 gm/cc.)

c) 20 kg of Ethyl alcohol (C_2H_5OH) is added to 120 kg of water to prepare the solution of ethyl alcohol in water. Calculate the weight fraction and mole fraction of ethyl alcohol in the final solution? [Al wt C = 12, H = 1, O = 16]

d) Explain in brief mixing and fluid transportation and it's necessity.

e) Explain distillation and drying with suitable example.

f) Distinguish between Saponification and Esterification.

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

a) Explain :

(i) Cracking

(ii) Chlorination with suitable example.

b) Compare gas absorption and desorption.

c) Give difference between conversion and yield.

d) Explain oxidation and reduction process with suitable examples.

e) What is yield and selectivity ? Explain.

Marks

f) Give any one industrial example of :

(i) Size Reduction

(ii) Mixing

(iii) Size separation

(iv) Filtration

6. Attempt any <u>FOUR</u> of the following: **16**

a) Explain level measurement using Bob and Tape method with neat sketch.

b) Name any four personal protective equipments and their specific application.

c) Explain Redwood viscometer with neat sketch.

d) Convert following temperature values in $^{o}_{k}$ and $^{o}_{f}$:

(i) 200°C

(ii) 150°C

e) Draw the diagram of mercury thermometer and explain it's working.

f) Explain sight glass method used in level measurement.
