17206

15116

3 Hours / 100 Marks Seat No. | | | | | | | | |

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.

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

Marks

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

a) Define molecular weight and equivalent weight.

b) What is difference between vapour pressure and partial pressure?

c) Convert:

(i) 105° F

(ii) 240° F

into °C

d) Name any four large scale industries.

e) What is difference between Basic unit and Derived unit?

f) Define "Distillation".

g) What is limiting reactant and excess reactant?

P.T.O.

Marks

h) Distinguish between catalytic cracking and thermal cracking.

i) Define specific gravity of a liquid.

j) State principle of mercury thermometer.

k) Define conversion and yield.

l) Give any 'Four' unit operations used in chemical industries.

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

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

b) Draw neat symbols of

(i) Centrifugal pump

(ii) Packed column

(iii) Ball mill

(iv) Screen

c) Draw and explain Bob and Tape method for measuring liquid level.

d) Explain how heat is transferred by Conduction, Convection and Radiation.

e) Describe screening.

f) State any four uses of sulphuric acid.

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

a) Find the molecular weight of

(i) H_2SO_4

(ii) $KMnO_4$

Data - (Atomic Weight – K = 39, Mn = 55, H = 1, S = 32, O = 16)

b) 20 grams of caustic soda are dissolved in water to prepare 500 ml of solution. Find the normality and molarity of solution.

c) Draw a sketch of Redwood viscometer.

Marks

d) Draw and explain the working U-tube manometer.

e) Identify the common oxidizing and reducing agent employed in chemical industries.

f) What do you mean by pyrolysis and cracking?

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

a) Describe the principles and method of solid-solid separation used in industries.

b) Define gas absorption and give its two industrial applications.

c) Explain size reduction and state why it is carried in industry.

d) State the characteristics of the block diagram and process flow diagram.

e) Explain briefly a mercury in a glass thermometer with a neat sketch.

f) Describe the unit process of sulphonation and chlorination.

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

a) With the neat sketch, describe the working of rotameter.

b) Explain drying in detail.

c) Draw a block diagram for the manufacture of sulphuric acid.

d) Define:

(i) Normality

(ii) Molarity

(iii) Molality

(iv) Boiling point

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

f) Differentiate between the unit operations of sedimentation and filtration.

Marks

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

a) Draw a process flow sheet for the manufacture of nitric acid.

b) Distinguish between unit processes and unit operations.

c) Convert a pressure of 2 atm to the following units.

(i) mm Hg

(ii) kPa

d) Define and give unit

(i) force

(ii) pressure

(iii) work

(iv) power

e) Sodium chloride weighing 200 kg is mixed with 600 kg potassium chloride. Find the composition of the mixture in

(i) Weight % and

(ii) Mole %

[Data - Molecular wt – NaCl = 58 and KCl = 4.5]

f) Define volatility and Relative volatility.