17325

14115
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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1.   **Attempt any <u>TEN</u> of the following:**   **20**

a) Define molanty and molarity with its unit.

b) Name any two small scale industries.

c) Define force give the unit of force in S.I. system.

d) Give the unit of pressure in S.I.

e) Name the two industries which manufacture products related to human health.

f) Who is the father of Indian Chemical Engineering? Where did he start chemical engineering discipline?

g) Define oxidation with one example.

h) Name modes of heat transfer.

i) Write two uses of H_2SO_4 and HNO_3.

j) Explain importance of a pilot plant in a chemical industry.

k) What is difference between density and specific gravity?

l) Write statement of Dalton's law.

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

a) How much HCl is required in m1 to prepare 3 liters on 1N solution?

b) Draw symbols of Jaw crusher, screen, ball mill and rotary dryer with one use of each.

c) Find the molecular weight of

   (i) H_2SO_4

   (ii) Na_2CO_3

At.wt. H = 1, S = 32 and O = 16

d) Convert a volumetric flow rate of $7200m^2/h$ to l/s.

e) Explain the importance of size reduction and size separation in chemical industry.

f) Define equivalent weight of element. Calculate eq. wt. of H_3PO_4 and $Al_2(SO_4)_3$.

Marks

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

    a) Write two units of each terms.

        (i)   Temperature

        (ii)   Pressure

        (iii) Viscosity

        (iv) Density

    b) Draw a neat diagram of a continuous distillation column.

    c) Define fluid and explain in brief handling of fluid.

    d) Give chemical reaction for sulphonation and nitration with one example each.

    e) Describe amination by ammonalysis and reduction.

    f) Define conversion, yield and reaction efficiency.

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

    a) State principle involved and use of drying process.

    b) Explain the principle involved in absorption can it be useful to control pollution?

    c) 80 gms of NaOH is dissolved in water to prepare 4 lit. Solution. Calculate the molarity of the solution.

    d) A mixture contains 100 gm NaOH and 200 gm KOH. Express their composition by

        (i)   Weight percent

        (ii)   Mole percent.

    e) Explain sulphonation and chlorination with reaction.

    f) Draw process flow diagram for H_2SO_4 manufacturing.

Marks

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

   a) Explain importance of distillation process in chemical industry. State its principle with example.

   b) Write two uses and reaction involved in manufacturing of nitric acid.

   c) How will you prepare 3 lit of 1 N solution from one lit. of 1 molar solution of H_3PO_4? (A. wt H = 1, P = 31, O = 16)

   d) Explain process of 'desorption'. Give two examples.

   e) Give an example of hydrogenation. Write the reaction involved, stating type of catalyst and temperature conditions used.

   f) State and explain Amagat's law.

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

   a) Explain level measurement using bob and type method.

   b) With neat sketch describe working of rotometer.

   c) Draw neat sketch of sight glass and float and tape method for level measurement.

   d) Convert:

      (i)   10 bar to atm

      (ii) 5 Mpa to bar.

   e) Describe the use of bourdon tube for pressure measurement.

   f) Convert 30°C into of and °K.

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