55526 Seat No. _____

First Year B. Sc. Examination

April / May – 2003

Industrial Chemistry : Paper - II

(Vocational)

Time : **3** Hours] [Total Marks : **70**

1 (a) Define the terms with units Force, Pressure, Work.

(b) Give an outline procedure for material balance without chemical reactions.

(c) Explain : Ideal gas, *Dalton's* law, NTP condition.

OR

1 (a) Prove the relation Volume % = Pressure % for a mixture of ideal gases.

(b) 98 gms of H_2So_4 acid (M.W 98gms / mole) is dissolved in water to prepare one live solution. Calculate normality and molarity of the solution.

(c) Explain *Rault's* law and *Hensy's* law.

2 (a) Explain (i) Distillation and (ii) Evaporation operations with block diagram used to solve material balance problems.

(b) Explain in brief Absorption operations with block diagram used for material balance.

(c) The ammonia air mixture containing 0.2 kg NH_3 per kg air enters into absorption system where ammonia is absorbed in water. The gas leaving the system is found to contain 0.004 Kg NH_3 per Kg of air. Find the % recovery of ammonia.

OR

2 (a) Write a note on Purge ratio.

(b) Explain : Limiting reactant, yield and selectivity.

(c) Write a note on recycling operations.

3 (a) Discuss the advantages and disadvantages of liquid and gaseous fuel.

(b) Explain *Hess's* law of constant heat.

(c) Calculate standard heat of reaction of the following reaction

$$2C_4H_{10(g)} + \frac{13}{2}O_{2(g)} \longrightarrow 8Co_{2(g)} + 10H_2O_{(l)}$$

Given : $\Delta H°f \left(C_4H_{10(g)}\right) = -30.14$ K Cal / mole

$\Delta H°f \left(CO_{2(g)}\right) = -94.05$ K Cal / mole

$\Delta H°f \left(H_2O_{(l)}\right) = -68.32$ K Cal / mole

OR

3 (a) What is commission ? Give a mechanism of commission.

(b) Discuss water softening process by in-exchange resign.

(c) Give a brief account on various raw material used for the manufacture of glass.

4 (a) Explain extractive and azeotropic distillation with suitable example.

(b) What is extraction ? Explain spray tower with diagram.

(c) Define polymers, their physical characteristics and their uses.

OR

4 (a) Give a brief account of the material used to develop colour in glass.

(b) Explain the polymer processing by injection moulding machine.

(c) Give all characteristics of good fuels.

5 Answer any **Three** of the following :

(i) What is crystallization ? Discuss any one crystallizer with diagram.

(ii) Write a note on Nucleation

(iii) Give application of evaporation in industry

(iv) Write a note on vacuum pumps

(v) Write a note on spray dryer.