



V. P. & R. P. T. P. Science College
B.Sc. (Fourth Semester)
Friday, 10th March 2017
Subject code: US04CICH02
Industrial Chemistry

Time: 03:00 pm to 04:30 pm

Total Marks: 25

Question 1: Choose the correct answer from the following:

3 marks

- Total pressure in the system is equal to the sum of partial pressure is.....
a. Boyle's law b. Dalton's law c. Amagat's law d. Ideal gas law
- Excess reactant is in excess than
a. Stoichiometric requirement b. Both a & b c. Theoretical requirement d. Neither a & b
- The amount of heat required to raise the temperature of one kg of substance by 1 °K is known as.....
a. Heat capacity b. Enthalpy c. Entropy d. Latent heat

Question 2: Answer any two short questions:

4 marks

- Explain: (a) Gross calorific value (b) Net calorific value
- An aqueous solution contains 40% Na₂CO₃ by weight. Express the composition in mole%.
- Define: (a) Yield (b) Selectivity

Question 3: Answer the following questions:

6 marks

Explain in detail about specific gravity scales.

OR

An aqueous solution of K₂CO₃ is prepared by dissolving 43 kg K₂CO₃ in 100 kg water at 293 K. Find (i) Molarity (ii) Molality (iii) Normality of the solution. Take density of solution as 1.3 kg/lit.

Question 4: Answer the following questions:

6 marks

List different steps which must be followed to solve material balance problems.

OR

A mixture of CuSO₄.5H₂O & FeSO₄.7H₂O weight 100 gm. It is heated in an oven at 100° C for the removal of water of hydration. The weight of the mixture after drying is found to be 60 gm. Calculate the weight ratio of CuSO₄.5H₂O to FeSO₄.7H₂O in original mixture. (Atomic weight: Cu-63, S-32, O-16, Fe-56, H-1)

Question 5: Answer the following questions:

6 marks

Derive the equation for efficiency of heat engine.

OR

Find the minimum amount of air required for complete combustion of 1 kg of fuel which contains C kg carbon, H kg hydrogen, S kg sulphur and O kg oxygen.