Chemical Engg Deptt. Sub 21103 (Chemical Process Calculation).For 2/ChE & 3/BT students. Nov2010 End term.

Instruction: Stepwise results must be shown. Answer all.

Full Marks 50. Time: 3 hours.   **1st page of your answer script must be reserved to write only the answers in ascending order**

Q1. A solution contains 62kg $CaCl_2$ per 100 kg water. Calculate the Wt of this soln required to dissolve 250 kg of $CaCl_2$,$6H_2O$ at 25^0C (solubility 7.38 kg mole of $CaCl_2$ per 1000 kg of water   (10)

Q2. Air (65^0C,760mm Hq, DPt 4.5^0C) enters a drying chamber and it leaves the chamber at 35^0C,755mm Hq, with DPt 24^0C.Calculate the volume in m^3/hr of the air required to remove 100 kg of water /hr.(VP of water 6.3mm Hq at 4.5^0C & 22.4 mm Hq at 24^0C).
                                                                        (10)

Q3. Q3. Calculate TFT of a gas (30% CO & 70% N2), when burnt with 200% excess air. Both gas & air enter at 25 ^oC.

Data : Ht of formations : CO2 = --94052 kcal/kg mole , CO= --26912 kcal/kgmole
 C_p(avg)in kcal/kgmole ^oC: CO2: 12.1 , O2 : 7.9 , N2: 7.55   (10)

Q4. Calculate recycle ratio, amount of product and waste per 100 kg of fresh feed.
                                                                (Marks = 4+3+3)
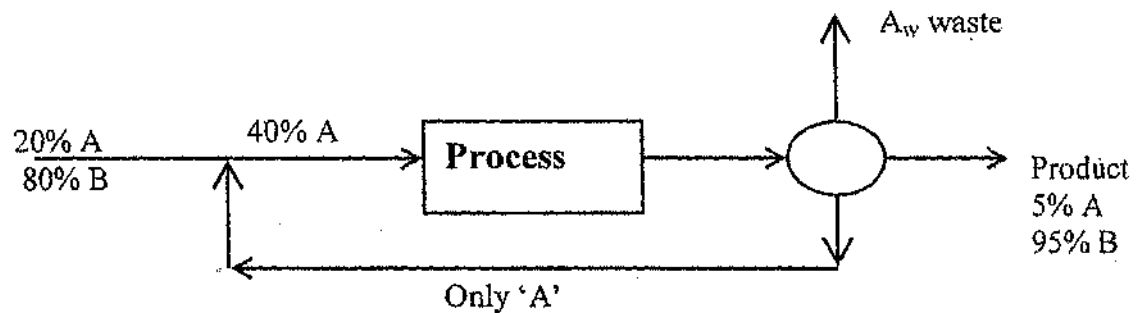
Q5.A coal (87% C ,7% H_2 & rest inert) is burnt with 40% excess air .
 Calculate
 a) kg of air used /kg of coal burnt b)Composition (by wt)of the flue gas for total combustion..   (5+5)