RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FIFTH SEMESTER EXAMINATION, MARCH 2021

THIRD YEAR [BATCH 2018-21]

Date : 16/03/2021 **INDUSTRIAL CHEMISTRY (HONOURS)**

Time : 11 am - 1 pm **Paper : V [Gr. B]** Full Marks : 50

Unit - I

Answer **any five** questions: [5 × 5]

1. a) Why little amount of gypsum is used in Portland cement?
   b) Write the difference between sulphate resisting cement and OPC. [2.5+2.5]
2. a) Write a short note on flash setting of cement.
   b) Write a short note on reactions occurs in rotary kiln. [2+3]
3. Outline the various steps involved in the manufacturing process of Portland cement by rotary Klin (Dry process methodology). Give a rough flow sheet of process. [5]
4. a) What is the role of accelerator and retarder in cement?
   b) Write the difference between HAC and OPC. [2+3]
5. a) Write the factors which are influencing the hydration reaction of cement.
   b) Write the major constituents of Portland cement? [3+2]
6. Write a short note on PPC & PSC. [5]
7. Write a short note on dry process for cement manufacturing. (draw a flow chart). [5]

Unit - II

Answer **any five** questions: [5 × 5]

8. What are the requirements of a good fuel? What is the difference between ultimate & proximate analysis? [2.5+2.5]
9. What is the coalification or metamorphism? What is the degree of maturity? What is pyrophoric? What is ignition & auto ignition temperature? What is fixed carbon? [1+1+1+1+1]
10. Which is the more efficient fuel between solid fuels & gaseous fuels and Why? What are the dis advantages of excess air in furnace? What are the compositions of Natural Gas? [2+1.5+1.5]
11. Write a short on Water Gas & Producer Gas. [2.5+2.5]
12. On analysis, a coal sample has the following compositions by weight, C = 78%, O_2= 04%, S = 05%, and Ash = 03% , NCV of fuel is 9797.7 Kcal/kg. Calculate the percentage of hydrogen and GCV of fuel. [5]
13. a) Which parameters affect the furnace efficiency?
    b) Calculate Gross Calorific Value of fuel sample of coal from the following data:

    mass of coal=0.6 gm, W=2200 gm, Sp. Heat =4.187 KJ/Kg/ºC, raise in temp. = 6.52ºC [2.5+2.5]
14. Calculate the GCV & NCV of fuel sample from the data:

    M=0.83gm, W = 3500gm, w= 385gm, T_2= 29.2ºC, T_1= 26.5 ºC, % of H_2 = 0.7 , S = 4.2 KJ/Kg/ ºC. [5]

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