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Department of Basic Sciences and Engineering (F. Y. B. Tech.)

ACADEMIC YEAR: 2024-25

ASSIGNMENT NO. 01

Q1. Explain proximate analysis of coal with significance.

Q2. Write a short note on Power Alcohol with advantages and limitations.

Q3. Explain construction and working of alkaline fuel cell.

Q4. Explain working of lithium ion battery with reactions in detail.

Q5. Describe the production of hydrogen for the steam reforming of methane with reactions.

Q6. 1gm of a coal was kept in an electric air oven at 110° C. for 1hr. The weight of coal after heating was 0.950 gm. 2 gm of same coal sample was freshly taken and kept it at 950°C for 7 minutes. Then weight of coal after that was 1.785 gm. This residue was kept at 750°C for half an hour. The left over in the crucible weighed 0.345 gm. Calculate % Moisture, % Volatile matter, % Ash and % Fixed Carbon.

Q7. A sample of coal contains C= 90%, H=3.5%, O = 3%, S= 0.5%, H_2O= 0.1%, N=0.5% and remaining Ash. Calculate the amount of air required for 1 kg of coal.

Q8. A gaseous fuel have the following percentage analysis by volume of CH_4= 14%, H_2 = 32%, N_2= 40%, and O_2= 14 %. If 25% excess air is used, calculate the volume of air required per $m^3$of gaseous fuel. Also calculate the percentage composition of flue gas.