Reg.No.										

प्रज्ञानं ब्रह्म

Manipal

INSPIRED BY LIFE

MANIPAL UNIVERSITY
Fifth Semester B.Tech. (Chemical Engineering)
END SEMESTER EXAMINATION – Nov/Dec 2015
SUBJECT: ENERGY ENGINEERING (CHE 305)

KNOWLEDGE IS POWER
MANIPAL INSTITUTE OF TECHNOLOGY

Time : 3 hrs **Max Marks: 100**

- **Answer any FIVE full questions and all questions carry equal marks.**
- **Missing data, if any, may be assumed suitably.**

1A.	Explain the general and special factors to be considered for furnace selection?	**(10 marks**
1B.	Describe Indian Energy scenario and per capita energy consumption. What is coal bed methane and gas hydrates?	**(10 marks)**
2A.	Explain the classification of coal cleaning processes along with the basis of separation. Describe the coal washing equipments and methods adopted in Indian coal washeries.	**(08 marks)**
2B.	Describe in detail the breakdown and rebuilding process adopted for refining of petroleum.	**(12 marks)**
3A.	What are the reaction zones in a gas producer? Explain the effect of steam on gas producer performance.	**(7 marks)**
3B.	Describe about cleaning and purification of gaseous fuels.	**(6 marks)**
3C.	Explain the guidelines and procedure for energy audit. What are the types of energy audit?	**(7 marks)**
4A.	Explain the properties and characteristics of peat, lignite and black lignite.	**(10 marks)**
4B.	The analysis of coal in boiler trial was C = 81%, H_2 = 4.5% , O_2 = 8% and remainder incombustible.The orsat analysis of dry flue gas was CO_2 = 8.3%, CO = 1.4% , O_2 = 10%, N_2 = 80.3%. Determine (i) weight of air supplied per kg of coal (ii)Percentage excess air (iii) Flue gas Analysis	**(10 marks)**
4C.	Explain important petroleum products and their application. Explain the purification processes for refining of petroleum fuels.	**(7 marks)**
5A.	Write a short note on coal preparation and coal storage	**(6 marks)**
5B.	Discuss on firing system such as (i) Pulverised fuel firing system (ii)Cyclone burners	**(7 marks)**
6A.	What are the components that are fully developed in bituminous coal and explain the grading of Indian bituminous coals?	**(10 marks)**
6B.	What are the basis for reporting results of solid fuels? Explain the following terminologies (i) NCV at constant volume (ii) GCV at constant pressure	**(5 marks)**
6C.	Explain any three important test carried out on liquid fuels. Explain the significance of these tests in utilization of liquid fuels?	**(5 marks)**