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SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

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Total number of pages:[2]

Total number of questions:06

B.Tech. || CHE || 4th Sem *6th sem Regular / Reappear*
Energy Engineering *May 2018*

Subject Code: BTCH-403A / BTCH 603

Paper ID:

(for office use)

Time allowed: 3 Hrs

2011 onwards

Max Marks: 60

Important Instructions:

- All questions are compulsory
- Assume any missing data

PART A (2marks x 10)

Q. 1. Short-Answer Questions:

- Differentiate between proximate analysis and ultimate analysis of coal?
- What are the different types of combustion processes?
- What do you understand by preparation of coal? Why it is needed?
- What are the various processes for biomass conversion?
- Write the composition of water gas and producer gas.
- Define photovoltaic effect.
- Differentiate between nuclear fission and nuclear fusion reactions.
- Which is the widely accepted theory for origin of petroleum? And why?
- What is spontaneous ignition temperature?
- Name any 4 refineries in India and their location?

PART B (8marks x 5)

Q. 2. What is carbonization of coal? Discuss the salient features of low temperature and high temperature carbonization of coal. Describe in detail the working of any by-product coke oven with its neat sketch. CO1, CO2

OR

- Explain "Fischer Tropsch process" for converting coal to liquid fuels. CO1, CO2
- Write the composition and classification of coal in brief.

Q. 3. The analysis of coal used in a boiler is as follows: 78.0 % Carbon, 7.0 % Hydrogen, 3.0 % Oxygen, 3.0 % Moisture, 3.0 % Sulphur and rest is ash. Determine the theoretical amount of air necessary for complete combustion of 1 kg of coal and percentage composition by weight of dry products of combustion. CO4

OR

What are the various coal burning equipments? Write in brief with the help of neat sketches. CO4

Q. 4. Discuss in detail the applications of wind energy. With the help of neat sketches, describe the working of horizontal axis wind turbine and vertical axis wind turbine. Also write the relative advantages and disadvantages of both types of wind turbines. CO3

OR

What are the various types of solar collectors? Mention their temperature range. Describe them in brief with the help of neat sketches.

- Q. 5. Describe with the help of a neat sketch the manufacture of producer gas. Also write its composition and calorific value. What are the various factors that affect the quality of producer gas?

OR

Describe with the help of a neat sketch the manufacture of carbureted water gas. What are the various factors that affect the quality of gas? Also write the composition, calorific value and applications of carbureted water gas.

- Q. 6. Write the properties and characteristics of motor gasoline.

OR

Write the properties and characteristics of lubricants.