Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PECH 5303

Fifth Semester Back Examination – 2014

FUEL AND ENERGY TECHNOLOGY

BRANCH : CHEM

QUESTION CODE : L268

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.
Assume suitable notations and any missing data wherever necessary.
Answer all parts of a question at a place.

1. Answer the following questions : 2 ×10

   (a) Differentiate between In-situ and Drift theory for origin of coal.

   (b) Mention the safe coal storing conditions.

   (c) What is petrography of coal ? Mention petrographic constituents of coal.

   (d) Strength of coke is measured by _____ index while hardness is measured by _____ index.

   (e) What is visbreaking ? Mention the T and P conditions for visbreaking.

   (f) _____ is added to increase the octane number of petrol.

   (g) Mention the use of Palladosulphite tube.

   (h) Write the properties of coke oven gas.

   (i) Mention the properties of thorium.

   (j) What are the elements of a nuclear reactor ?

2. (a) Discuss in detail the significance of constituents of coal. 8

   (b) Write the uses of coal. 2

3. Critically compare between LTC and HTC. 10

P.T.O.

4. With a neat diagram, explain the fluidized bed catalytic cracking process. 10

5. Discuss the manufacturing process of carburatted water gas with a neat diagram. 10

6. Discuss in detail the Fischer-Tropsch synthesis. 10

7. The volumetric composition of a gaseous fuel is H_2 = 50 %, CH_4 = 20 %, C_2H_4 = 2 %, CO_2 = 5 %, CO = 16 %, and rest N_2. Determine : 10

   (i) MW,

   (ii) Density of the mixture at STP and NTP, and

   (iii) Wt %.

8. Write short notes on any **two** : 5×2

   (a) Properties of coke

   (b) Knocking

   (c) Coal gas

   (d) Fast breeder reactor.