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

Total number of printed pages – 2

B. Tech

PECH 5303

Fifth Semester Examination – 2013

FUEL AND ENERGY TECHNOLOGY

BRANCH : CHEM

QUESTION CODE : C-367

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.

1. Answer the following questions : 2×10

   (a) Differentiate between Gondwana and Tertiary coals.

   (b) Why freshly mined coal is risky ? Mention the safe coal storing conditions.

   (c) Write the Fraser and Yancey equation for washing efficiency.

   (d) Mention the typical specification for Indian metallurgical coke.

   (e) Define vis-breaking. Is it essential ? If so,why ?

   (f) Mention some of the chemical reactions in catalytic reforming.

   (g) What do you understand by knocking ? What is done to improve knocking characteristics ?

   (h) What are sweet gas and producer gas ?

   (i) Mention the advantages and disadvantages of Kopper-Totzek process.

   (j) Discuss the importance of multiplication factor for the removal of neutrons.

2. (a) Briefly discuss the coal washing processes. 4

   (b) What do you understand by washability of coal ? Draw and explain washability curves. 6

P.T.O.

3. (a) With a neat diagram discuss the production of metallurgical coke by by-product coke ovens. 5

(b) Discuss the properties of coke. 5

4. With neat flow sheet, describe the crude oil distillation, highlighting the products. Also discuss the major engineering problems. 10

5. (a) Discuss the parameters affecting cracking. 4

(b) Discuss the producer gas production method highlighting the reaction zones. Also mention its properties and uses. 6

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

7. (a) With a neat diagram, briefly explain the Lurgi gasification process. 5

(b) Discuss about the elements of nuclear reactors. 5

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

(a) High temperature carbonization

(b) Fluidized bed catalytic cracking process

(c) Water gas

(d) Properties of uranium.