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Total number of printed pages – 02

B.TECH  
PECH5303

5<sup>th</sup> Semester Regular / Back Examination 2015-16

**FUEL AND ENERGY TECHNOLOGY**

**BRANCH : Chemical**

**Time : 3 Hours**

**Max Marks : 70**

**Question Code : T598**

*Answer Question No. 1 which is compulsory and any FIVE from the rest.*

*The figures in the right-hand margin indicate marks.*

*Answer all parts of a question at a place.*

1. **Answer the following questions :** 2 x 10
- (a) What is Rank of Coal? Mention the different types of coal according to rank with %C.
  - (b) Write down the properties of Indian metallurgical coke?
  - (c) Mention the different types of coal according to petrography and Indian classification?
  - (d) What is caking and coking coal.
  - (e) What are the elements of nuclear reactor?
  - (f) Why pre-treatment of crude oil is necessary before refining? Name the pre-treatment methods.
  - (g) What is visbreaking?
  - (h) What is natural gasoline and sweet gas.
  - (i) What are the requirement for a combustion process
  - (j) Why cracking of oil is done. Discuss the effects of variables in catalytic cracking.
2. (a) Explain the different losses during coal storage. How it can be prevented. 3
- (b) With a neat flow diagram, explain the washability curve. Explain about sink and float method of coal washing. 7

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| 3. | (a) What is carbonization of coal? Differentiate between high and low temperature carbonizations   | 4     |
|    | (b) Discuss the by-product coke oven process for manufacturing coke.   | 6     |
| 4. | (a) What is cracking .Why is its necessity.  | 4     |
|    | (b) Discuss about Fluidised bed catalytic cracking process. Mention some of the effects of variables in catalytic cracking.  | 6     |
| 5. | (a) What is Reforming? What are the feed, products and chemical reaction involved in this process?   | 2     |
|    | (b) Discuss the various crude oil distillation systems. Discuss particular about Single stage Atmospheric distillation with all possible products and its uses.  | 8     |
| 6. | (a) Mention the advantages of CNG over LPG.  | 4     |
|    | (b) Discuss in detail about coal gasification process with respect to all necessary reaction ,process condition ,engineering problems by Lurgi Gasification process by stating all its advantages and disadvantages      | 6     |
| 7. | What is synthetic fuel? Discuss in detail about synthetic gas production with respect to all necessary reaction, process condition, engineering problems by Fischer-Tropsch process stating all its merits and demerits. | 10    |
| 8. | <b>Write short notes on any two:</b>   | 5 x 2 |
|    | (a) Kopper Totzek Gasification process   |       |
|    | (b) Merits and Demerits of Nuclear Energy.   |       |
|    | (c) Water Gas  |       |
|    | (d) Gasification chemistry during producer gas.  |       |

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