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Total Number of Pages : 02

B.Tech
PCE4I104

4th Semester Regular / Back Examination 2018-19

FUEL AND ENERGY TECHNOLOGY

BRANCH : CHEM

Time : 3 Hours

Max Marks : 100

Q.CODE : F685

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

Part-I

Q1 Only Short Answer Type Questions (Answer All-10) (2 x10)

- State elemental composition of bituminous coal.
- State drift theory of formation of coal.
- Differentiate between caking coal and coking coal.
- Write properties of metallurgical coke.
- State the impurities present in crude oil.
- What is OPEC and name its member countries?
- Define Diesel index.
- What is a gas producer and draw its figure?
- Describe the preparation of carbureted water gas.
- What is multiplication factor in nuclear reactors?

Part-II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Explain storage of coal to avoid spontaneous combustion.
- Explain in detail the washability curves with neat figure.
- Differentiate between HTC and LTC.
- Explain froth floatation process of coal cleaning.
- Explain vacuum distillation of crude oil.
- Differentiate between cracking and reforming.
- Explain Fischer-Tropsch synthesis with flow diagram.
- Write the properties of products obtained from atmospheric distillation of crude oil.
- Write the production of coke oven gas and blast furnace gas.
- Write short note on Thorium.
- A sample of coal was found to contain the following: C= 86%, H= 4%, O= 2%, N=10%, the remaining being ash. Estimate the quantity of minimum air required for complete combustion of 1 kg sample. Find the composition of dry flue gas by volume, if 40% of excess air is supplied.
- A sample of coal was found to contain the following percentage composition: C= 75%, H=5.2%, O= 12.8%, N=3.7%,S= 1.2%, ash=2.1%. Calculate the minimum amount of air necessary for complete combustion of 1 kg coal.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Describe in detail about the characteristics & distribution of Indian coals. Discuss the calorific values and uses of all types of coal. **(16)**

Q4 Explain the recovery of byproducts from coke oven. Discuss the products obtained from coal tar distillation. **(16)**

Q5 Explain fluidized bed catalytic cracking process with neat figure. **(16)**

Q6 Name different types of nuclear reactors with their advantages and disadvantages. Explain pressurized water reactor. **(16)**