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

Total number of printed pages – 2

B. Tech

PEMN 5301

Fifth Semester Regular Examination – 2014

FUEL TECHNOLOGY

BRANCH(S) : MM, MME

QUESTION CODE : H 202

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) Define fuel. Classify types of fuels with example.

   (b) What is meant by metamorphism ?

   (c) Define caking index.

   (d) Draw the actual washability curve diagram.

   (e) What is formed coke? How is it used in power industries ?

   (f) What is meant by rank of coal ?

   (g) Write the properties of coke.

   (h) Define calorific value of fuel.

   (i) What is coal blending ?

   (j) Differentiate between caking and coking of coal.

2. (a) What is carbonization of coal ? Classify. Discuss the mechanism of coal carbonization. 5

   (b) Describe about wind energy and its application. 5

3. (a) Describe the properties of coal on the basis of which coal is selected for metallurgical uses. 5

   (b) Explain basic oxygen furnace gas. Write its properties, characteristics and uses. 5

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4. (a) How charcoal is alternatively used as a source of energy in metallurgical and power industries ? 5

(b) Explain solid energy waste and its industrial application. 5

5. (a) Write about tidal energy and how is it useful in metallurgical and power industries ? 5

(b) What is petroleum coke? How is it used in metallurgy ? 5

6. (a) A producer gas with the composition by volume 30% CO, 12% CO_2, 2% O_2, N_2 66% is burnt with 20% excess air. If the combustion is 98% complete calculate the composition by volume of the flue gases. 5

(b) Explain blast-furnace gas. Write its properties, characteristics and uses. 5

7. (a) What is activated carbon ? Write its uses. 5

(b) Determine the amount of air supplied when a medium fuel oil with 83.9% carbon, 12.4% H_2, 14.2% sulphur, 0.4% O_2, 0.2% ash by weight is burnt with 20% excess air. 5

8. Differentiate between (any two) : 5×2

(a) Gross and net calorific value

(b) Coking and non coking coal

(c) Renewable and non renewable energy sources.