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BME-031

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BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER AIDED MANUFACTURING)

Term-End Examination

December, 2013

BME-031 : ENERGY CONVERSION

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any seven** questions, all questions carry **equal** marks. Use of **steam tables** and **calculator** is allowed.*

1. (a) What is heat transfer ? What are its positive and negative directions ? Explain with the help of some examples. 5

   (b) Explain the difference between generator and motor on the basis of mode of energy conversion. 5

2. (a) Describe the working principle of 4 - stroke S.I engine with the help of cycle. 5

   (b) The daily output of an electric power generating station is 1600 MW hr. and the coal consumption is 800 tonnes/day. If the calorific value of coal is 7000 kCal/kg. Calculate the thermal efficiency of the station. 5

3. In a bomb calorimeter test on gasoline, the HCV was determined and found to be 46900 KJ/kg. If the fuel contains 14.4 % H_2 by mass. Calculate the LCV of gasoline given ufg at 25°C for $H_2O = 2304.4$ KJ/kg. 10

4. Write short notes on : 2.5x4=10

   (a) Bio-mass gasification system

   (b) Wind - energy system for lifting water

   (c) Photovoltaic system

   (d) Solar energy

5. (a) What are the differences between axial flow and radial flow double-motion reaction turbines ? 5

   (b) Briefly describe the major components of open cycle gas turbine power plants. 5

6. A steam plant working on perfect regenerative cycle use dry steam at a pressure of 42.18% kg/cm^2 absolute and exhausts it at 0.07 kg/cm^2 absolute. What is the work done per kg of steam ? Find the ideal efficiency of the cycle. 10

7. (a) Explain advantages of gaseous fuels over liquid fules from combution point of view. 5

   (b) Explain the effect of insufficient air on combustion of fuel. 5

8. Write short notes on : 2.5x4=10

(a) Heat of Neutralization

(b) Heat of Atomization

(c) Heat of Combustion

(d) Evaluation of bond - energy

9. With the help of neat diagram describe the working of : 5x2=10

(a) Fire tube boiler

(b) Lo effler boiler

10. (a) Derive the expression of efficiency of CI engine. 5

(b) What are the various performance parameter considered for water turbines ? Explain briefly. 5