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BME-031

01947

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER AIDED MANUFACTURING)

Term-End Examination

June, 2013

BME-031 : ENERGY CONVERSION

Time : 3 hours *Maximum Marks : 70*

*Note : Answer **any (7)** questions. Use of scientific calculator is permitted. Suitable data may be assumed if required.*

1. (a) Explain cycle of operations of a 4 stroke engine. 5

   (b) What is power ? Explain electro -chemical energy conversion with the help of block diagrams. 5

2. (a) Explain photo-electric energy conversion with a neat sketch. 5

   (b) What is the difference between coal fired power plant and diesel engine power plant with respect to nature of fuel used ? 5

3. (a) What do you mean by calorific value of fuels ? Explain : 6

   (i) Combustion efficiency

   (ii) Fuel - air ratio

   (iii) Excess air required for combustion

(b) What is wind energy ? Mention suitable locations in India where wind energy can be exploited. 4

4. (a) Explain biogas generating system with a neat sketch. 5

(b) Explain with a neat sketch principle of working of : 5

(i) Impulse steam turbine

(ii) Reaction steam turbine

5. (a) Explain the necessity of condensers. 5

(b) Explain with a neat sketch Evaporative condensers. 5

6. How does overall efficiency of a combined gas turbine power plant improved using reheat, regeneration and intercooling together ? Explain with PV diagrams. 10

7. (a) What is Octane number and Cetane number ? Explain also knocking and anti knocking characteristics of fuel. 4

(b) Explain the following : 6

(i) Law of conservation of mass

(ii) Avogadro's law

(iii) Amagat's law.

8. (a) Explain following laws of thermo-chemistry : 5

(i) Hess's law of constant heat summation

(ii) Law of Lavoisier and Laplace

(b) Explain with a neat sketch Lamont boiler. 5

9. (a) Explain Fluidised Bed Combustion with a neat sketch. 5

(b) Give classification of boilers and write one example of each. 5

10. (a) Explain the cycle of operation of a 2-stroke diesel engine. 5

(b) Explain the following terms in connection with hydro-electric power plant : 5

(i) Dam

(ii) Spillway

(iii) Penstocks

(iv) Surgetank

(v) Head race and tail race.