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BME-031

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

01409

Term-End Examination

December, 2010

BME-031 : ENERGY CONVERSION

Time : 3 hours *Maximum Marks : 70*

Note : *Answer seven questions. Use of calculator is allowed. Assume any missing data suitable.*

1. (a) Explain the various forms of energy and the need for the energy conversion systems. 5

   (b) Discuss "Energy consumption as a measure of prosperity". 5

2. (a) Which are the physical laws of combustion ? Explain in brief. 5

   (b) What do you mean by mass fraction and mole fraction. 5

3. (a) Explain a Solar Power Plant with neat sketch. 5

   (b) Explain Wind Power Plant and Tidal Power Plants with sketches. 5

4. (a) With neat sketches, explain different types of steam nozzles. Enlist the applications of nozzles. 5

(b) With a neat sketch explain the principles of working of Impulse and Reaction turbines. 5

5. (a) Explain the classification of steam condensers. Explain any one condenser with a neat sketch. 5

(b) A simple impulse turbine has a blade speed of 350 m/sec and blade speed to steam velocity (inlet) ratio is 0.40. Nozzles are inclined at 22° to the plane of rotation and steam leaves the stage at an angle of 76° to the plane of rotation. 5

Determine

(i) Blade inlet angle θ

(ii) Kinetic energy of steam at outlet.

6. (a) What do you mean by regeneration and reheating of steam in power plants ? Explain regeneration cycle with T-S diagram 5

(b) Explain open cycle gas turbine power plant with a neat sketch. 5

7. (a) Write a note on environmental benefits from alternative fuels. 5

(b) Explain the requirement of different A/F ratios in an I.C engine operation. 5

8. (a) Explain fluidised bed combustion (FBC) system used in boilers. 5

(b) Explain the classification of boilers. 5