

**B.Tech. MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING)**

Term-End Examination

00443

June, 2017

BME-031 : ENERGY CONVERSION

Time : 3 hours

Maximum Marks : 70

Note : *Attempt any seven questions. All questions carry equal marks. Use of scientific calculator is permitted. Assume suitable data, if any is missing.*

1. (a) What is energy ? Discuss its conversion. 5
- (b) How much energy does a 3 kW electric fire convert in 2 hours ? 5
2. (a) What is multistage energy conversion ? Explain. 5
- (b) Explain the working of a 4-stroke S.I. engine with neat sketches. 5

3. (a) Calculate the amount of theoretical air required for the combustion of 1 kg of acetylene (C_2H_2) to CO_2 and H_2O . 5
- (b) What is Calorific Value ? Discuss GCV and NCV. 5
4. Explain the following : EAPC10
- (a) Combustion efficiency
- (b) Fuel-air ratio
- (c) Excess air coefficient
- (d) Submerged combustion
- (e) Diffusion combustion
5. Write short notes on the following :
- (a) Wind Power Plant 5
- (b) Geothermal Power Plant 5
6. (a) Explain the Bio-gas generating system with a neat sketch. 5
- (b) Derive the expression of efficiency of a simple open cycle gas turbine plant. 5
7. (a) What do you mean by a steam nozzle ? Explain its types. 5
- (b) Explain the necessity of condensers. 5

8. (a) Explain Ejector condenser with a neat sketch. 5
- (b) Explain Reheat steam cycle. 5
9. (a) Explain Fluidised bed combustion boilers. 5
- (b) Explain Magneto-hydrodynamic Power Generation. 5
10. (a) Air enters the compressor of a gas turbine power plant operating on Brayton cycle of 1 bar, 27°C. The pressure ratio in the cycle is 6. If $W_t = 2.5 W_c$, where W_t and W_c are the turbine and compressor, work respectively, calculate the maximum temperature and the cycle efficiency. 5
- (b) Describe a closed cycle gas turbine. 5
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