

201942

No. of Printed Pages : 4

**BME-031**

**B. TECH. IN MECHANICAL  
ENGINEERING (COMPUTER  
INTEGRATED MANUFACTURING)**

**Term-End Examination**

**June, 2019**

**BME-031 : ENERGY CONVERSION**

*Time : 3 Hours*

*Maximum Marks : 70*

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*Note : Attempt any seven questions. Use of scientific calculator is permitted. Assume missing data suitably.*

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1. (a) Explain photo-electric energy conversion system with a neat sketch. 5
- (b) Which part of nuclear power plant is called the heart of the plant ? With a neat sketch, discuss its function. 5
2. (a) Explain solar-steam generating system using parabolic concentrating collector. 5

(A-9) P. T. O.

- (b) With a neat sketch, explain working principle of any *one* of the following : 5
- (i) Impulse steam turbine
  - (ii) Reaction steam turbine
3. How does the overall efficiency of combined gas turbine power plant improve using reheat, regeneration and intercooling together ? Explain with PV diagram. 10
4. (a) Discuss the following laws of thermo-chemistry : 5
- (i) Law of Lavoisier and Laplace
  - (ii) Hess' law of constant heat summation
- (b) With a neat sketch, describe Velox boiler. 5
5. (a) Briefly explain the various non-conventional energy sources. 5
- (b) What is function of a steam nozzle ? How are steam nozzles classified ? 5

6. (a) With the help of a suitable sketch, explain the working principle of electrostatic precipitator. 5
- (b) Describe the integrated power generating system for rural areas. 5
7. (a) What do you understand by life cycle costing ? Explain the total life cycle cost of photovoltaic system. 5
- (b) On the basis of mode of energy conversion, discuss the energy conversion in : 5
- (i) Railway transportation system
- (ii) Road transportation system
8. (a) A diesel fuel contains 70% C, 10% H<sub>2</sub>, 5% O<sub>2</sub>, 1% S and rest incombustible by weight. If air contains 23% oxygen by weight, find the amount of air required for complete combustion of 1 kg fuel. 5
- (b) State the advantages and disadvantages of nuclear power plants over coal based power plants. 5

9. (a) Define enthalpy of water, enthalpy of steam, latent heat and dryness fraction. Write the expressions for enthalpy of steam in wet, saturated and superheated states. 5
- (b) Discuss the relative advantages and limitations of an open cycle gas turbine over a closed cycle gas turbine. 5