PVP 12

Code: ME6T6D

III B.Tech - II Semester – Regular Examinations – April 2016

ALTERNATIVE SOURCES OF ENERGY
(MECHANICAL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1. Derive an expression for the daily extraterrestrial radiation which would fall on a surface having a slope β and facing due south (i.e., ν= 0). 14 M

2. Derive an expression for instantaneous collection efficiency for a cylindrical parabolic collector. 14 M

3. Write down the set of equations appropriate for a stratified water storage tank which is assumed to consist of three well mixed solutions. 14 M

4.

a) Sketch the diagram of HAWT and explain the functions of its main components. 9 M

b) A two – blade HAWT is installed at a location with free wind velocity of 20 m/s. the rotor diameter is 30 m. what rotational speed should be maintained to produce maximum output? 5 M

5. With the help of a neat diagram, explain the working of a gasifier using wood – chip biomass. What further processing is required to use the gas produced in a diesel engine? 14 M

6. Describe various stages of exploration and development of geothermal resources. 14 M

7.

a) What is the source of tidal energy? What is the minimum tidal range required for a practical tidal plant? 6 M

b) Explain the operation of an oscillating water type of wave device. 8 M

8. Describe the basic principle of operation of an MHD generator. Also derive expression for maximum power generation per unit volume of a generator. 14 M