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**Question Paper Code: 31972**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Elective

Mechanical Engineering

01UME906 - RENEWABLE SOURCES OF ENERGY

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define Solar constant.
2. A solar cell gives a current of 0.5 A and the voltage of 0.4 V at maximum power point. What is the maximum power generated by the solar cell?
3. Illustrate the relationship between wind power and wind velocity.
4. Define cut-in wind speed.
5. What is pyrolysis?
6. What is biomass? What are the benefits of using biomass for energy generation?
7. Bring out the advantages of OTEC.
8. List the three main ways of power generation from tidal energy.
9. Give the schematic diagram of a fuel cell.
10. What are the problems in using hydrogen as fuel?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain the construction and operation of pyranometer used for solar radiation measurement. (10)

(ii) How will you improve the efficiency of a flat plate collecting system? (6)

Or

(b) (i) What is photovoltaic effect? Outline the factors that affect the performance of a solar cell. (10)

(ii) List the applications of Solar photovoltaic. (6)

12. (a) Explain the design aspects of horizontal axis wind turbine. (16)

Or

(b) (i) Illustrate the factors influencing the selection of site for a wind turbine. (8)

(ii) Outline the concept of hybrid wind systems. (8)

13. (a) Explain the various routes of biomass conversion with neat layout. (16)

Or

(b) With neat sketch explain any one biogas digester for organic solid wastes. (16)

14. (a) Describe the working of a closed cycle OTEC with a neat schematic diagram. (16)

Or

(b) Illustrate the working principle of geothermal power plants and analyze the design considerations of geothermal power plants. (16)

15. (a) Explain the methods of storing liquefied hydrogen and pipeline transportation of hydrogen with schematic diagram. (16)

Or

(b) Explain the working principle of alkaline fuel cell and advantages of fuel cell power plants. (16)