Roll No. | | | | | | | | | | |

MANUFACTURING ENGINEERING

VI / VIII Semester

ME 9022 NEW AND RENEWABLE ENERGY SOURCES

(Regulation R 2008)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Define : Solar Day.
2. Explain – Solar Pond.
3. Why does wind speed increase with height?
4. What is the theoretical maximum power a rotor can produce?
5. List the sources of organic wastes.
6. How are biogas plants classified? Explain.
7. Discuss on the major benefits of earth's heat as an energy source.
8. What are the different means of tidal energy utilization?
9. Explain the principles of operation of a fuel cell.
10. What are the advantages of hydrogen as a fuel?

Part – B (5 x 16 = 80 marks)

11. i) Explain the effects of any four major parameters on the performance of solar concentrating collectors. (8)

    ii) Make note on the physics and current-voltage characteristics of solar cell (8)

12. a) i) How are the variations of wind speed in time divided into four main categories? Explain them. (8)

    ii) Discuss on wind turbine topology (8)

    (OR)

    b) i) Make note on the technical issues related to wind farms (8)

    ii) Explain the environmental benefits and impact of wind energy systems (8)

13. a) i) What is meant by 'Energy Farms'? Explain. (8)

ii) Give the details of mechanisms of photosynthesis relevant to biomass energy. (8)

(OR)

b) i) Draw the flow chart showing biomass energy conversion processes and products, and explain (8)

ii) Discuss in detail any two types of alcohol fermentation. (8)

14. a) i) Make note on Geothermal power plants (8)

ii) Write on applications of Geothermal energy. Give suitable examples (8)

(OR)

b) i) Explain with sketch, the functioning of Tidal power plant. (8)

ii) Discuss on closed cycle and open cycle OTEC system (8)

15. a) i) What do you mean by 'Solid Oxide Fuel Cell (SOFC)'? Explain the operating principle. (8)

ii) Make note on the applications of fuel cell. (8)

(OR)

b) (i) How is Hydrogen produced in large scale? Explain the process in detail. (8)

ii) What an the applications of Hydrogen as a 'Source of Energy'? Explain. (8)