Register Number: ……..

B.E DEGREE EXAMINATIONS: NOV/DEC 2012

Seventh and Fifth Semester

MECHANICAL ENGINEERING

MEC141: Renewable Energy Sources

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Primary energy sources are classified into
   a) Organic and inorganic b) Renewable and nonrenewable
   c) Gas and liquid d) Solid and liquid
2. Global warming is primarily caused by increasing concentrations of
   a) Solar radiation b) Atmospheric air
   c) Greenhouse gases d) None of the above
3. To measure the global radiation, instrument used is
   a) Pyranometer b) Pyrheliometer
   c) Thermometer d) Tachometer
4. Solar collectors are used to
   a) Concentrate the solar radiation b) reflect the solar radiation
   c) Absorbs the solar radiation d) None of the above
5. Power can be generated from wind turbine is proportional to
   a) Cube of wind speed b) Wind speed
   c) Fourth power of wind speed d) Square of wind speed
6. The important property of the working fluid used in the Ocean Thermal Energy Conversion (OTEC) is
   a) High boiling point b) High specific heat
   c) Low boiling point d) Low specific heat
7. Biomass processed into a more convenient form either liquid or gas is called as
   a) Biomass b) Biogas
   c) Biofuel d) None of the above
8. Major portion of landfill gas consists of
   a) Carbon monoxide b) methane
   c) Carbon dioxide d) Nitrogen
9. Generation of electric current which is mutually perpendicular to direction of magnetic field

and perpendicular to the direction of flowing hot gas is known as

a) Magneto Hydro Dynamic converter
b) Thermoelectric converter
c) Thermoionic converter
d) Ferroelectric converter

10. Plasma gas used in the thermoionic converter is

a) Oxygen
b) Cesium gas
c) air
d) nitrogen

PART B (10 x 2 = 20 Marks)

11. What are the benefits of renewable energy sources?
12. Why electricity is considered as a secondary energy source?
13. Explain the basic types of solar thermal collectors.
14. What are the different industrial applications of solar energy?
15. What is the type of generator used in wind power plant?
16. Differentiate tide and wave.
17. What is the difference between biofuel and biogas?
18. Name some of the agricultural waste.
19. What is the seebeck effect?
20. What is the difference between fuel cell and battery?

PART C (5 x 14 = 70 Marks)

21. a) i) Discuss the energy resources available in nature. (7)
ii) What are Greenhouse Gases? (7)

(OR)

b) Explain in detail about the emissions in the environment and global warming.

22. a) Write short notes on different types of solar energy collectors with neat diagrams.

(OR)

b) i) What is the principle of solar photovoltaic power generation? (7)
ii) Write short notes on I) Solar pumping II) Solar Cooking and III) Solar arrays. (7)

23. a) i) State the essential features of a probable site for a wind form. (7)
ii) Explain the terms I) Yaw control II) Pitch control and III) Teethering control (7)

(OR)

b) What is geothermal energy? Explain with neat sketch, how can geothermal energy utilized for electric power Generation?

24. a) i) Write about energy from biomass. (7)

ii) Write about energy from biogas. (7)

(OR)

b) i) What are the factors affecting biogas generation. (7)

ii) Explain energy from waste. Write briefly about the energy from agricultural waste. (7)

25. a) i) Explain the working of thermoelectric converter with neat sketch. (7)

ii) With neat sketch, explain the working of thermoionic converter. (7)

(OR)

b) What is Faraday's effect? With neat diagram explain the working of MHD system.

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