KUMARAGURU
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Register Number: ……..

B.E DEGREE EXAMINATIONS: NOV 2015

(Regulation 2009)

Seventh Semester (Fast Track)

MECHATRONICS ENGINEERING

MCT155 **:** Renewable Energy Sources

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. A minimum temperature difference of --------- is required for practical energy conversion between the warm surface ocean water and the colder deep water

   a) 70 C b) 20 C

   c) 10 C d) 50 C

2. ---------- is the angle between the Sun's ray incident on the plane surface (Collector) and the normal to that surface

   a) Inclination angle b) Solar azimuth angle

   c) Angle of incidence d) Tilt angle

3. A major disadvantage of wind generator to produce electricity is _____.

   a) the emissions it produces once in place b) its energy efficiency compared to conventional power sources

   c) that people can use a single mill or develop a large-scale wind farm d) the initial startup cost

4. _____Oxides of NO2 concentration can damage respiratory tissues.

   a) 100 -140 ppm b) 50-100 ppm

   c) 150-220 ppm d) 50-75 ppm

5. One advantage of using hydrogen fuel cells is _____.

   a) a. the potential for production of greenhouse gases b) the ease of transporting and storage

   c) the energy efficiency d) that they are nonpolluting

6. Boiling point of the hydrogen

   a) - 104 C b) - 313 C

   c) - 20 C d) - 253 C

7. Which of the following is not a bio-mass source?
   a) Gobar gas
   b) Coal
   c) Wood
   d) Nuclear energy
8. The rise and fall of water level in the sea during the tides represented by
   a) Cosine curve
   b) Sine curve
   c) Triangular curve
   d) Square curve
9. Solar radiation received on Earth's surface without change in direction is called
   a) beam radiation
   b) diffuse radiation
   c) direct radiation
   d) Flux radiation
10. Basic principle behind the thermo electric power generator is
   a) Hall effect
   b) Raman effect
   c) Seebeck effect
   d) Nernst effect

PART B (10 x 2 = 20 Marks)

11. Draw the energy cycle of the earth.
12. Differentiate energy conservation and energy efficiency.
13. What is solar pond?
14. Identify the benefit of solar cooling system
15. Mention the use of Betz limit.
16. How do you classify the circulation of winds on the earth's surface?
17. List the application of bio mass plant.
18. Name the main components of a agricultural waste management system?
19. What are the advantages of Magneto Hydro Dynamic systems?
20. What is fuel cell?

PART C (5 x 14 = 70 Marks)

21. a) What are the conventional and non-conventional energy sources? Describe briefly.

(OR)

   b) Compare the various types of Renewable Energy Sources and mention the impact and feasibility of each source in Indian context.

22. a) Explain a typical focusing type solar collector with sun tracking mechanism. List the advantages and disadvantages of the same.

(OR)

b) Explain the working of low temperature solar power plant with neat diagram.

23. a) Discuss the operation of a horizontal axis wind turbine (HAWT) with neat diagrams

(OR)

b) Sketch two types of tidal power generation plants and explain the working theory.

24. a) Explain about the biomass gasification plant with neat diagram.

(OR)

b) State the basic principle of operation of bio-gas plant and explain the operation of a commercial type of bio-gas plant with relevant sketches.

25. a) Explain the operation of MHD (Magneto hydrodynamic power) generator with neat sketch. Also write its advantages and disadvantages.

(OR)

b) Describe the various methods of production of hydrogen for use as energy carrier.

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