



B.E DEGREE EXAMINATIONS: APRIL 2015

(Regulation 2009)

Eighth Semester

MECHATRONICS ENGINEERING

MCT155: Renewable Energy Sources

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Global warming is mainly caused due to
 - a) Emission of heat from engines
 - b) emission of CO₂ due to burning of fossil fuels
 - c) Use of nuclear energy
 - d) air pollution
2. Which of the following is not a Primary Energy Source?
 - a) Oil
 - b) Natural gas
 - c) Electricity
 - d) Wood
3. Which of the following is renewable energy source?
 - a) Gasoline
 - b) Solar Energy
 - c) Coal
 - d) Natural gas
4. Energy available in fuel is stored as
 - a) Heat energy
 - b) Chemical energy
 - c) Atomic energy
 - d) Explosive energy
5. Solar cells are made of
 - a) Cadmium
 - b) Silicon
 - c) Germanium
 - d) Aluminum
6. Wind blows because of a difference in
 - a) Temperature
 - b) Latitude
 - c) Longitude
 - d) Height
7. The Ocean thermal energy conversion system that is meant to generate power is most suitable in
 - a) Sub-tropical region
 - b) Tropical region
 - c) Cold region
 - d) Moderate climate region

8. The tidal energy of a sea wave is the sum of its
 - a) Mechanical energy & thermal energy
 - b) Potential energy & hydropower energy
 - c) Potential energy & kinetic energy
 - d) Kinetic energy & thermal energy
9. Biogas is produced when anaerobic bacteria digest organic matters in absence of oxygen which is called
 - a) Anaerobic reduction
 - b) Anaerobic digestion
 - c) Anaerobic oxidation
 - d) anaerobic drying
10. The thermoelectric generator works on
 - a) Seeback effect
 - b) Wein's law
 - c) Faraday's law
 - d) Gibb's law

PART B (10 x 2 = 20 Marks)

11. Brief about the energy cycle of earth.
12. List the importance of renewable energy resources?
13. Name the instruments used for the measurement of solar radiation.
14. Outline the concept of solar towers.
15. List the types of windmills.
16. What are the components of tidal power plants?
17. Differentiate Chemical conversion and Biochemical conversion of biomass.
18. List the rural wastes which can be used in biomass plants.
19. List a few geothermal energy sources in India.
20. State the difference between a fuel cell and a battery.

PART C (5 x 14 = 70 Marks)

21. a) Explain the potential impacts of harnessing the different renewable energy resources.

(OR)

- b) Write short notes on
 - (i) Environmental aspects of energy utilization (7)
 - (ii) Emissions and Global warming (7)
22. a) (i) Demonstrate the working principle of Evacuated tube solar collector. (7)
 - (ii) State the merits and demerits of Evacuated tube collector when compared to Flat plate solar collector. (7)

(OR)

- b) (i) Illustrate the working of active solar water heating system and state its potential applications. (7)
- (ii) Describe the working principle of solar ponds with the help of a neat sketch. (7)

23. a) Describe the working principle of
- (i) Geothermal power plant. (7)
 - (ii) Tidal plants. (7)

(OR)

- b) Explain the characteristics and design aspects of Horizontal axis wind mill.

24. a) Write short notes on
- (i) Waste burning power plant. (7)
 - (ii) Energy from agricultural waste. (7)

(OR)

- b) Describe the principle of working of Energy from bio mass and bio gas plant with a neat sketch.

25. a) (i) Draw the schematic diagram of an MHD power generating system having heat recovery steam generator and explain the functioning of the system. (10)
- (ii) State the advantages of MHD power generation. (4)

(OR)

- b) (i) Describe the principle of working of H₂-O₂ fuel cell with the help of a neat sketch. (10)
- (ii) State the possible uses and limitations of fuel cells. (4)
