



B.E DEGREE EXAMINATIONS: APRIL/MAY 2016

(Regulation 2009)

Eighth Semester

MECHANICAL ENGINEERING

MEC141: Renewable Energy Sources

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

- The raw material for atomic bomb is
 - U^{235}
 - U^{238}
 - Plutonium
 - Thorium
- The solar power has a potential of approximately 178 billion MW which is about _____ times the world's demand
 - 20
 - 200
 - 2000
 - 20000
- 1 Langley is equal to
 - $1 \text{ cm}^2/\text{cal}$
 - $1 \text{ cal} / \text{cm}^2$
 - $1\text{k cal} / \text{cm}^2$
 - $1 \text{ cm}^2/1 \text{ kcal}$
- The CPC reflectors can be designed as
 - Flat one sided absorber
 - Flat two sided absorbers
 - Wedge like absorbers
 - All of the above collectors
- Doubling the rotor blade diameter will result in _____ times increase in the available wind power
 - 2
 - 4
 - 8
 - 16
- Non thermal areas are having a temperature gradient of
 - $10\text{-}40^\circ\text{C}$ per km depth
 - 70°C per km depth
 - 100°C per km depth
 - $100\text{-}200^\circ\text{C}$ per km depth
- The bacteria's which grow in the presence of oxygen are called
 - Aerobic
 - Anaerobic

- b) i) Explain the working of solar furnace with neat sketches. (7)
- ii) Illustrate the working principle of solar water heater. (7)

23. a) Explain the design considerations of horizontal axis wind turbines.

(OR)

b) Discuss the working principle of closed OTEC cycle.

24. a) Explain the different types of biogas plants in detail.

(OR)

b) Discuss the various methods for obtaining energy from biomass.

25. a) Explain the principle of working and constructional details of a basic thermionic generator.

(OR)

b) Classify the types of fuel cells based on fuel used and explain the working of H₂ fuel cell.
