Reg. No. : | | | | | | | | | | |

Question Paper Code: 49706

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Elective

Mechanical Engineering

14UME906 - RENEWABLE SOURCES OF ENERGY

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Terrestrial radiation has a wavelength in the range of:

   (a) 0.2μm to 4μm (b) 0.2μm to 0.5μm

   (c) 0.380μm to 0.760μm (d) 0.29μ to 2.3μm

2. Which of the following is a renewable energy source?

   (a) Bitumen (b) Solar Energy (c) Coal (d) Natural Gas

3. At present the share of hydro power in the country's total generated units is around

   (a) 20% (b) 25% (c) 30% (d) 35%

4. Greenhouse effect refers to increase in

   (a) Global temperature (b) Carbon monoxide
   (c) Atmospheric pressure (d) Greenery

5. Ratio of maximum demand to connected load is termed as

   (a) Load factor (b) Power factor
   (c) Demand factor (d) Form factor

6. The objective of energy management is

(a) To minimize energy costs (b) To minimize environmental effects
(c) Both (a) and (b) (d) None of these

7. A mass balance for energy conservation does not consider which of the following

(a) steam (b) water (c) raw materials (d) lubricating oil

8. In the equation, Energy consumed = C + (M x Production), where 'C' is

(a) Variable energy consumption (b) Fixed energy consumption
(c) Specific energy Consumption (d) None of these

9. The temperature at the inner core of the earth is about:

(a) 1000^{o} C (b) 4000^{o} C (c) 4000^{o} C (d) 500^{o} C

10. Specific energy Consumption can be expressed in which of the following units.

(a) Tone/Kwh (b) KCal/Kg (c) Kcal/Kwh (d) None of these

PART - B (5 x 2 = 10 Marks)

11. What are primary and secondary energy sources?

12. What is the type of generator used in wind power plant?

13. Write any two items used as biomass fuels.

14. Discuss the disadvantages of geothermal plant.

15. List out different methods of energy storage.

PART - C (5 x 16 = 80 Marks)

16. (a) What is the principle of solar photovoltaic power generation? What are the main elements of a PV system? (16)

Or

(b) (i) With the help of schematic diagram explain the working of solar thermal water pump (8)
(ii) Describe the flat plate collector with the help of a suitable diagram. . (8)

17. (a) Explain briefly about the horizontal wind mills with neat sketch. (16)

Or

(b) Explain the principle and application of wind electric system. State the basic components and their working in wind electric system. (16)

18. (a) (i) Write about energy from biomass. (8)

(ii) Write about energy from biogas. (8)

Or

(b) (i) What are the factors affecting biogas generation? (8)

(ii) Write short note on bio energy by burning plants. (8)

19. (a) What are the main types of OTEC power plants? Describe their working in brief. (16)

Or

(b) Explain with neat sketch, the methods of operation of tidal power generation. (16)

20. (a) (i) Explain the construction and working principle of fuel cell with neat sketch. (8)

(ii) Explain the principle of operation of alkaline fuel oil. (8)

Or

(b) Explain the performance characteristics of battery and its equivalent circuit. (16)

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