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Question Paper Code : 60584

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026

Seventh Semester

Electrical and Electronics Engineering

EE8703 – RENEWABLE ENERGY SYSTEMS

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is Sustainable Development?
2. Write the limitations of renewable energy sources.
3. What range of wind speed is to be considered favorably for wind power generation?
4. Define Tip Speed Ratio.
5. Draw the I-V Characteristics of PV System.
6. Define concentration ratio of a solar collector.
7. Name the constituents of biogas.
8. What is the current status of geothermal energy generation in India?
9. Draw the schematic of fuel cell.
10. Define hybrid energy systems.

PART B — (5 × 13 = 65 marks)

11. (a) Explain about the different types of renewable energy sources.

Or

- (b) Examine the impact of environmental consequences of fossil fuel usage.

12. (a) Using Betz model of a wind turbine, derive the expression for power extracted from wind. Evaluate the maximum theoretical power that can be extracted.

Or

- (b) Sketch the diagram of a HAWT and also explain the functions of its main components.

13. (a) Explain the various types of solar cells based on material thickness and the type of junction structure.

Or

- (b) Draw a schematic diagram of solar pond based electric power plant with cooling tower and also explain its working.

14. (a) Explain the various geothermal power plants also, explain binary cycle power plant, with neat diagram.

Or

- (b) Describe in detail the various factors affecting bio digestion of a gas.

15. (a) Explain the operation of hydrogen energy system with schematic diagram.

Or

- (b) With a neat sketch, explain the operation of OTEC plants.

PART C — (1 × 15 = 15 marks)

16. (a) Discuss the principle of operation of a simple single-effect tidal power plant and elucidate a graph of sequential operating modes.

Or

- (b) Analyze the environmental consequences of fossil fuel usage with suitable case study.