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B.TECH
(SEM VIII) THEORY EXAMINATION 2022-23
RENEWABLE ENERGY RESOURCES

Time: 3 Hours

Total Marks: 70

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt any Seven questions in brief. 2×7 = 14

- a. Highlight the merits and demerits of renewable forms of energy.
- b. Describe the advantages and disadvantages of solar energy.
- c. Describe the photovoltaic effect.
- d. Discuss the secondary energy sources.
- e. Discuss the MHD generator.
- f. Write short note on geothermal energy.
- g. Write short note on HAWT and VAWT.
- h. Write the chemical reaction takes place in Fuel Cell.
- i. Give the resources of biomass.
- j. What is ocean thermal energy?

SECTION B

2. Attempt any three of the following: 7×3=21

- a. What do you mean by energy resources? Classify it. Explain in detail the conventional energy resources.
- b. Give the systematic arrangement of a typical silicon solar cell in module, panel and array. Also discuss the factors that limit the efficiency of the solar cells.
- c. Explain the difference between a fuel cell and battery. What are the uses and advantages of fuel cells?
- d. Describe main considerations in selecting a site for wind farm. Discuss merits and demerits of wind energy.
- e. Classify biomass conversion technologies. Explain anaerobic digestion process for production of methane.

SECTION C

3. Attempt any one part of the following: 7×1=7

- a. What is MNRE? What is history of it? Discuss its mission?

- b. What is array? Write about the solar cells, its material and its preparation.

4. Attempt any *one* part of the following: 7×1=7

- a. Describe the various methods of solar radiation measurement. How we can measure all (direct, diffuse and global) radiations with the help of Pyranometer?
- b. Discuss the principal of a concentrating solar collector. Classify it. Write the advantages and disadvantages of it over flat plate collector. What is the concentrating ratio for focusing collector.

5. Attempt any *one* part of the following: 7×1=7

- a. What is meant by dry steam, wet steam and hot water geothermal system?
- b. What is a fuel cell? Describe the principle and working of a H_2O_2 fuel cell. Give its limitations also.

6. Attempt any *one* part of the following: 7×1=7

- a. Explain the working of thermoelectric generator. Differentiate between thermoelectric and thermoionic conversion system.
- b. Describe the basic principle of wind energy conversion and derive the expression for power developed due to wind.

7. Attempt any *one* part of the following: 7×1=7

- a. Explain the basic principle of ocean Thermal Energy Conversion (OTEC). Describe the "Closed Cycle" OTEC System.
- b. What are tides? How they are formed? Discuss the functioning of a tidal power plant.