

IV B.Tech I Semester Advance Supplementary Examinations, March - 2023
RENEWABLE ENERGY SOURCES
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

UNIT I

- 1 a) Explain why the quantity of solar energy reaching the earth's surface fluctuates. [7]
 b) Demonstrate the flat plate collector and its functioning. [8]
 (OR)
- 2 a) Clearly illustrate the building and operation of a solar pond and give its benefits and drawbacks? [7]
 b) Describe solar distillation and drying in detail. [8]

UNIT II

- 3 a) Examine the functioning of biogas-powered internal combustion engines and examine their performance characteristics. [7]
 b) Explain the method by which local breezes are generated. [8]
 (OR)
- 4 a) Describe the OTEC closed (Anderson) cycle. [7]
 b) Explain various HAWT blade designs and write respective related characteristics. [8]

UNIT III

- 5 a) Mention five distinct kinds of energy-efficient retrofits and describe their applications and advantages in two to three sentences. [7]
 b) Discuss about the following types of fuel cells [8]
 i) Polymer electrolyte membrane fuel cells ii). Direct methanol fuel cells
 (OR)
- 6 a) What is variable speed drive and what is its operating principle? [7]
 b) List the Applications of VSD. [8]

UNIT IV

- 7 a) Why production process should prioritize the use of recyclable and environmentally friendly materials. [7]
 b) Provide a description on the factors that impact the sustainability of the machining process and their target levels. [8]
 (OR)
- 8 a) When comparing the sustainable qualities of different materials, what factors should you keep in mind? [7]
 b) Provide some details regarding the processes of sustainable manufacturing. [8]

UNIT V

- 9 Create a list of the primary objectives that should be met by green buildings when picking a location. [15]
 (OR)
- 10 Name some environmentally friendly materials for construction and discuss about the benefits they provide. [15]

