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Course Code

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Eighth Semester B.E. Degree Examinations, May 2026

NON CONVENTIONAL ENERGY SOURCES

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
 2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO: PI)</u>
<u>Module-1</u>			
1.	a. Differentiate conventional and non-conventional energy sources.	10	(1 :1: 1.2.1)
	b. Explain the classification of energy sources and the need for non-conventional energy sources in India with suitable examples.	10	(2 :1: 1.2.1)
(OR)			
2.	a. Describe the working principles, advantages, and limitations of the following energy sources: (i) Solar energy (ii) Wind energy	10	(2 :1: 1.2.1)
	b. Discuss tidal energy and geothermal energy with their advantages, disadvantages.	10	(2 :1: 1.2.1)
<u>Module-2</u>			
3.	a. Illustrate Pyranometer used for solar radiation measurement with neat sketches and working principles.	10	(2 :2: 1.2.1)
	b. Describe beam radiation and diffuse radiation with a neat sketch.	10	(2 :2: 1.2.1)
(OR)			
4.	a. Discuss solar constant, spectral distribution, and solar radiation data measurement.	10	(2 :2: 1.2.1)
	b. Describe Pyrheliometer used for solar radiation measurement with neat sketches and working principles.	10	(2 :2: 1.2.1)
<u>Module-3</u>			
5.	a. With a neat sketch describe the working principle of solar water heater.	10	(2 :3: 1.2.1)
	b. Explain the following solar radiation geometry with suitable diagrams: (i) declination angle (ii) hour angle (iii)zenith angle (iv) surface azimuth angle	10	(2 :3: 1.2.1)
(OR)			
6.	a. Discuss the performance of liquid flat plate collectors, including heat removal factor, efficiency factor, and instantaneous efficiency.	10	(2 :3: 1.2.1)
	b. Describe the working principle and applications of Photo-Voltaic (PV) systems.	10	(2 :3: 1.2.1)

Module-4

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| 7. | a. | Explain the properties of wind and major problems associated with wind energy systems. | 10 | (2 :4: 1.2.1) |
| | b. | Describe the working of Horizontal Axis Wind Turbines (HAWT) with neat sketch. | 10 | (2 :4: 1.2.1) |

(OR)

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| 8. | a. | Describe the working of double basin tidal power plant, and their advantages and limitations. | 10 | (2 :4: 1.2.1) |
| | b. | Describe the working of open cycle Ocean Thermal Energy Conversion (OTEC) power plant, and their advantages. | 10 | (2 :4: 1.2.1) |

Module-5

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| 9. | a. | Describe the method of biogas production using anaerobic digestion with steps involved. | 10 | (2 :5: 1.2.1) |
| | b. | With a neat sketch, explain the working of KVIC (floating drum) biogas plant. | 10 | (2 :5: 1.2.1) |

(OR)

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| 10. | a. | Discuss hydrogen energy: production methods, storage, transportation, advantages, and risks. | 10 | (2 :5: 1.2.1) |
| | b. | With a neat sketch explain the working of hot dry rock system geo thermal system | 10 | (2 :5: 1.2.1) |

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