

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Fifth Semester B.E. Degree Examinations, September / October 2024

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. Compare conventional and non-conventional energy sources.	06	(1:1:1.4.1)
	b. Elaborate on India's production and reserves of commercial energy sources.	08	(2:1:1.4.1)
	c. With a neat sketch explain the production of oil from oil shale.	06	(2:1:1.4.1)
(OR)			
2.	a. Briefly discuss the need and importance of non-conventional energy sources for future power needs of the country.	06	(2:1:1.4.1)
	b. Write short notes on: (i) Solar Energy (ii) Water power	08	(1:1:1.4.1)
	c. List out merits and demerits of non-conventional energy sources.	06	(2:1:1.4.1)
<u>MODULE – 2</u>			
3.	a. Define the following with sketch: (i) Solar Constant (ii) Direct radiation (iii) Diffuse Radiation.	06	(2:2:1.4.1)
	b. Explain with neat sketch working principle of Pyranometer.	08	(2:2:1.4.1)
	c. With a neat sketch explain the working principle of sunshine recorder.	06	(2:2:1.4.1)
(OR)			
4.	a. Define the following angles: (i) Latitude angle (ii) Hour angle (iii) Solar altitude angle (iv) Surface azimuth angle (v) Declination angle.	10	(1:2:1.4.1)
	b. With a neat sketch, explain the working of liquid flat plate collector. Mention its applications.	10	(2:2:1.4.1)
<u>MODULE – 3</u>			
5.	a. Write short notes on: (i) Orientation of Solar angles (ii) transmissivity of the cover system (iii) transmissivity — absorptivity product.	06	(2:3:1.4.1)
	b. Explain temperature distribution between the collector tubes with suitable sketches.	08	(2:3:1.4.1)
	c. List out advantages and disadvantages of flat-plate collectors.	06	(3:3:1.4.1)
(OR)			
6.	a. With a neat sketch, explain the working of solar cell.	08	(3:3:1.4.1)
	b. Explain briefly the factors which affect the performance of a flat-plate collector.	06	(3:3:1.4.1)
	c. Define (i) collector heat removal factor (ii) collector efficiency factor (iii) Overall heat transfer coefficient.	06	(2:3:1.4.1)

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

MODULE – 4

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| 7. | a. | With a neat sketch, explain Horizontal Axis wind turbine (HAWT). | 10 | (2:4:1.4.1) |
| | b. | Explain factors affecting site selection of wind turbine. List the advantages and limitations of HAWT and VAWT. | 10 | (2:4:1.4.1) |

(OR)

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| 8. | a. | With a neat sketch, explain the working principle of OTEC system. | 10 | (2:4:1.4.1) |
| | b. | With a neat sketch, explain single and double basin arrangement of tidal energy. | 10 | (2:4:1.4.1) |

MODULE – 5

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| 9. | a. | With a neat sketch, explain the working of liquid dominated (flash) geothermal energy conversion system. | 10 | (2:5:1.4.1) |
| | b. | With a neat sketch, explain the working of KVIC (Indian design/floating drum) digester. | 10 | (2:5:1.4.1) |

(OR)

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| 10. | a. | Write a short note on fuel cell. What are the applications of hydrogen energy? | 10 | (2:5:1.4.1) |
| | b. | With a neat sketch explain the principle of working of a hydrogen fuel cell. | 10 | (2:5:1.4.1) |

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