

## RENEWABLE ENERGY SOURCES

**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>
<b><u>Module-1</u></b>			
1.	a. Differentiate between renewable energy source and non-renewable energy source.	06	(1:1:1.4.1)
	b. Explain the principles of renewable energy source.	08	(2:1:1.2.1)
	c. With a neat sketch explain the production of oil from oil shale.	06	(2:1:1.4.1)
(OR)			
2.	a. Describe about the availability of renewable energy source in India.	06	(2:1:1.4.1)
	b. With a neat diagram explain geo-thermal power plant.	08	(2:1:1.4.1)
	c. Briefly describe about Internet of Energy (IoE).	06	(2:1:1.4.1)
<b><u>Module-2</u></b>			
3.	a. Define the following terms: (i) Direct Radiation (ii) Diffused Radiation (iii) Global Radiation (iv) Solar Constant	06	(1:2:1.4.1)
	b. With a neat sketch explain the working of Pyrheliometer.	08	(2:2:1.4.1)
	c. With a neat sketch explain solar distillation.	06	(2:2:1.2.1)
(OR)			
4.	a. With a neat sketch explain photovoltaic system for power generation.	06	(2:2:1.2.1)
	b. What is solar cell? With a neat sketch explain the working of solar cell.	08	(2:2:1.2.1)
	c. List the advantages and disadvantages of photovoltaic system.	06	(1:2:1.4.1)
<b><u>Module-3</u></b>			
5.	a. With a neat sketch explain the main functional components of Horizontal Axis Wind Turbine (HAWT).	10	(2:3:1.4.1)
	b. With a neat sketch explain fixed dome type bio-digester.	10	(2:3:1.4.1)
(OR)			
6.	a. Explain photosynthesis process.	06	(2:3:1.4.1)

- b.** With a neat sketch explain the main functional components of Vertical Axis Wind Turbine (VAWT). **08 (2:3:1.4.1)**
- c.** List the different biomass resources, and explain any two of them in brief. **06 (2:3:1.4.1)**

#### **Module-4**

- 7. a.** Write a short note on tides and waves as energy suppliers and mechanics. **06 (2:4:1.4.1)**
- b.** With a neat sketch explain the working of single basin tidal power plant. **08 (2:4:1.4.1)**
- c.** List out the advantages and limitations of tidal power. **06 (1:4:1.2.1)**

**(OR)**

- 8. a.** List out the fundamental characteristics of tidal power. **06 (1:4:1.4.1)**
- b.** Explain the working principle of closed cycle OTEC system, with a neat diagram. **08 (2:4:1.4.1)**
- c.** List out the major problems associated with ocean thermal energy conversion system. **06 (1:4:1.4.1)**

#### **Module-5**

- 9. a.** With a neat sketch explain the principle of working of a hydrogen fuel cell. **06 (2:5:1.4.1)**
- b.** Explain electrolysis method of hydrogen production technologies. **08 (2:5:1.4.1)**
- c.** List the advantages and disadvantages of hydrogen energy. **06 (1:5:1.4.1)**

**(OR)**

- 10. a.** With a neat sketch explain the operating principle of fuel cell. **06 (2:5:1.4.1)**
- b.** With a neat sketch explain the principle of working of a hydrogen-oxygen fuel cell. **08 (2:5:1.4.1)**
- c.** What are the applications of hydrogen energy and list out the problems associated with hydrogen energy? **06 (1:5:1.4.1)**

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