

**CERTIFICATE IN ENERGY TECHNOLOGY
AND MANAGEMENT (CETM)**

Term-End Examination

June, 2022

**OEY-002 : RENEWABLE ENERGY
TECHNOLOGIES AND THEIR USES**

Time : 3 hours

Maximum Marks : 70

Note : Attempt any **five** questions. All questions carry equal marks.

1. (a) Define solar constant. Write down the main components of solar radiation falling on Earth. 2+5=7
- (b) Evaluate the extraterrestrial solar radiation on January 15 and December 31. 7
2. (a) What are the different modes of heat transfer ? Explain each with example. 7
- (b) Define “thermal efficiency” and “heat removal factor” of flat plate solar water heater. Also explain how collector efficiency of solar water heater can be increased. 7

3. (a) Explain Photovoltaic effect. What are the basic conditions for the occurrence of photovoltaic effect ? 6
- (b) (i) How is the efficiency of PV module calculated ?
- (ii) What factors affect the efficiency of PV module ?
- (iii) Name the different instruments required to measure the efficiency of PV module experimentally. 8
4. (a) Explain how electricity is generated with Biomass. 6
- (b) Define the following : 8
- (i) Pour point
- (ii) Calorific value
- (iii) Viscosity
- (iv) Density
5. Explain the following : 6+4+4=14
- (a) Solar Greenhouse Dryer
- (b) Indirect Solar Dryer
- (c) Mix Mode Dryer

6. (a) What are the different climatic zones of India ? What are the criteria on the basis of which these climate zones are defined ? 7
- (b) Explain the importance of ventilation in heating and cooling of the building. Also define solarium and solar gain. $4+1\frac{1}{2}+1\frac{1}{2}=7$
7. Write short notes on any **two** of the following : $2\times 7=14$
- (a) Solar Building Systems
- (b) SPV Pumping Systems
- (c) Solar Still
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