

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

Term-End Examination

June, 2020

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

Time : 3 Hours

Maximum Marks : 70

Note : (i) Attempt any five questions.

(ii) All questions carry equal marks.

1. (a) Explain different factors which affect the amount of solar radiation reaching a surface.

7

- (b) What are the main components of solar radiation falling on the earth ? Also, define solar constant.

7

- (b) Describe solar air collector with a non-porous absorber and a porous absorber with neat schematic. 7
3. (a) Draw and explain I-V characteristics of solar cell. Calculate fill factor for a solar cell which has the following parameter :
- $V_{OC} = 0.2 \text{ V}$, $I_{SC} = - 5.5 \text{ mA}$, $V_{max} = 0.125 \text{ V}$,
 $I_{max} = - 3 \text{ mA}$. 4 + 2
- (b) Explain the following : 8
- (i) Solar cell
 - (ii) PV module
 - (iii) PV array
 - (iv) Effect of temperature on solar cell efficiency.
4. (a) Compare floating gas holder and fixed dome type biogas plant with neat schematics. 8
- (b) Explain solar drying system with neat block diagram. 6

5. (a) What are the various techniques used in drying ? Explain mix mode dryer. 7
- (b) What is solar passive building ? Write the advantages and disadvantages of solar passive building. 7
6. (a) Describe greenhouse effect in detail. Explain the impact of greenhouse effect in nature. 6
- (b) Explain the following with respect to bio-oil : 8
- (i) Flash point
 - (ii) Pour point
 - (iii) Viscosity
 - (iv) Calorific value
7. Write short notes on any *two* of the following :

$$2 \times 7 = 14$$

- (a) Solar water heater
- (b) Pyrolysis
- (c) Cost components of solar drying unit