

**CERTIFICATE IN ENERGY TECHNOLOGY
AND MANAGEMENT (CETM)****Term-End Examination****December, 2015****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) State the Kirchhoff's Law of Radiation.
How does solar radiation affect weather? 7
- (b) How is the average energy from the Sun that reaches the surface of the Earth estimated? 7
2. (a) Explain the concept of photovoltaic effect with a neat sketch. 7
- (b) Describe the difference between grid-connected and stand-alone PV systems with a neat schematic diagram. 7
3. (a) Write the operation and working of a biogas plant with a neat diagram. 7
- (b) What are the various problems and constraints for biogas development? 7

4. Define the following related to drying : $7 \times 2 = 14$
- (a) Moisture content (Wet basis)
 - (b) Pick-up efficiency
 - (c) Thermal efficiency
 - (d) Humidity
 - (e) Moisture content (Dry basis)
 - (f) Bone dry
 - (g) Equilibrium moisture content
5. (a) Explain in detail the following building systems : 10
- (i) Passive systems
 - (ii) Hybrid systems
 - (iii) Active systems
- (b) What are the effects of global warming on the environment ? 4
6. (a) Discuss the functions of a box-type solar cooker. What are the main components of a box-type solar cooker ? 7
- (b) Describe the importance of ventilation in heating and cooling of buildings. 7
7. Write short notes on any *two* of the following : $2 \times 7 = 14$
- (a) Solar water heater
 - (b) Solar still
 - (c) SPV pumping system