

No. of Printed Pages : 3

MRW-005

**MASTER OF SCIENCE
(RENEWABLE ENERGY AND
ENVIRONMENT) (MSCRWEE)**

Term-End Examination

December, 2025

**MRW-005 : SOLAR ENERGY AND
APPLICATIONS**

Time : 3 Hours

Maximum Marks : 70

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

1. (a) Explain the terms absorptivity, reflectivity and transmissivity of radiant energy. How are they related to each other for a black body and an opaque body ? 7

- (b) What do you know about Power Conversion Efficiency and Fill Factor (FF) of a solar cell ? 7
2. (a) Explain various types of solar tracking system. 7
- (b) Give classification of solar collector on the basis of absorber plate. 7
3. (a) What is Solar PV System ? Give detailed classification of Solar PV System. 7
- (b) Draw the design diagram for typical solar PV rooftop installation with all necessary components. 7
4. (a) What are the important factors which should be followed during day to day operation of solar water pumping system ? 7
- (b) Explain natural circulation and forced circulation type solar water heaters. 7
5. (a) Explain the purpose of glazing in solar air heater. State the disadvantages of non-porous type of solar air heaters. 7

[3]

- (b) Describe the concept of direct gain heating and cooling of solar passive buildings. Which material should be used in such designs ? 7
6. (a) Discuss the various factors responsible for greenhouse effect. 7
- (b) Describe the following broad features of three main types of building : 7
- (i) Passive building system
- (ii) Active building system
- (iii) Hybrid system
7. Write short notes on any *four* of the following : 3.5×4=14
- (a) Characteristic parameters of drying any agricultural product
- (b) Types of solar cookers
- (c) Main features of solar still
- (d) V-I characteristics of PV cell
- (e) Stefan-Boltzmann and Kirchhoff's law of thermal radiation
- (f) Various losses in the solar module

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