

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

Term-End Examination

June, 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) Discuss the processes through which the earth-atmosphere system maintains heat balance. 7
- (b) Explain the various factors that limit the efficiency of PV solar energy conversion device. 7

2. (a) Describe the dual axis solar tracking system with its advantages and limitations. 7
- (b) Derive an expression for the fin efficiency of flat plate collector. 7
3. (a) Discuss the salient features of the centralized and distributed solar power plant. 7
- (b) State and explain the design criteria for solar PV roof top installations. 7
4. (a) What is the effective hife of a PV module ? State the factors on which voltage and current output of a PV module depends. 7
- (b) Describe the working principle of natural circulation water heater with the help of a neat sketch. 7
5. (a) Explain the purpose of glazing in solar air heaters. Write an expression for the thermal efficiency of solar air heaters. 7
- (b) Describe the areas for SPV integration into buildings. 7

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6. (a) Write a typical solar building design procedure. 7
- (b) Compare various drying techniques with their relative advantages and disadvantages. 7
7. (a) Explain the working principle and construction of box type solar cooker. 7
- (b) Describe the main features of a solar still. 7
8. Write short notes on any *four* of the following : 3.5×4=14
- (a) Greenhouse effect
- (b) Trombe wall
- (c) Solar water pumping system
- (d) Fabrication of solar cell
- (e) Solar thermal energy conversion
- (f) Stefan-Boltzmann law

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