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MRW–005

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

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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