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MRW-005

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

Term-End Examination

June, 2023

MRW-005 : SOLAR ENERGY AND APPLICATIONS

Time : 3 Hours

Maximum Marks : 70

Note : Answer any *five* questions.

1. (a) Define the following terms : 7
 - (i) Emissivity
 - (ii) Components of solar radiation
- (b) Explain power conversion efficiency and fill factor (FF) of a solar cell. 7
2. (a) What are the major losses in PV array system ? How is a PV panel rated ? 7

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- (b) Give the classification of solar collectors, which are used in solar thermal conversion systems. 7
3. (a) Elaborate the function of Grid connected solar PV system with a neat block diagram. 7
- (b) State and explain the various design steps for solar PV installations. 7
4. (a) Describe the important factors which should be followed during day to day operation of solar water pumping system. 7
- (b) How do active and passive solar collector work in a solar water heating system ? What are the site requirements for installation of a solar water heater ? 7
5. (a) Describe the concept of direct gain heating and cooling of solar passive buildings. 10
- (b) Describe *four* distinct design elements of solar buildings. 4

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6. (a) Write the principles of solar drying and list its merits and demerits. 7
- (b) What is greenhouse effect ? Write the impact of greenhouse effect on environment. 7
7. Write short notes on any *four* of the following :

$$4 \times 3 \frac{1}{2} = 14$$

- (a) Solar Stills
- (b) Energy balance equation of flat plate collector
- (c) Solar cookers
- (d) Climatic zones in the country
- (e) Solar thermal power plant
- (f) Building integrated solar photovoltaic system
- (g) Construction of PV module

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