No. of Printed Pages : 4

MRW–003

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

Term-End Examination

December, 2025

MRW–003 : RENEWABLE ENERGY SYSTEM

Time : 3 Hours *Maximum Marks : 70*

Note : *(i) Attempt any **seven** questions.*

(ii) All questions carry equal marks.

(iii) Use of scientific calculator is permitted.

1. (a) Is geothermal energy renewable or non-renewable ? What are the advantages and disadvantages of using geothermal energy ? 5

   (b) What is coal sampling ? How does a coal preparation plant work ? How do you select the type of crusher for coal ? 5

2. (a) What are the factors which affect the amount of solar radiation reaching the surface ? What causes the hourly variations of the solar radiation reaching the earth ? 5

   (b) Describe different types of solar water heaters. 5

3. (a) Explain the purpose of glazing in solar air heaters. State the main disadvantages of non-porous type of solar air heaters. 5

   (b) What is a solar photovoltaic system ? Describe its operating principle. 5

4. (a) Describe wind energy for water pumping and off-grid power generation. 5

   (b) Classify the hydel power plants based on operating head. Mention the values of heads on which they are used to work. 5

5. (a) Define biomass. What are the resources of biomass ? What are the benefits of using biomass for energy generation ? 5

(b) What is aerobic digestion ? What material can be feed in digesters ? Besides biogas, what comes out of the digesters ? 5

6. (a) What are the environmental impacts of producing biogas ? Does biogas contribute to climate change ? Justify your answer. 5

(b) What are the differences between batch plants, continuous plants and semi-continuous plants ? Describe in detail. 5

7. (a) Explain the working of a geothermal power plant with the help of a neat sketch. 5

(b) Write short notes on any *two* of the following : $2 \times 2\frac{1}{2} = 5$

(i) Carbon capture utilization and storage

(ii) Thermal decomposition of methane

(iii) Blue hydrogen and green hydrogen

8. (a) Discuss the storage of hydrogen as metal hydrides in detail. 5

(b) What are piezoelectric materials ? Discuss in detail. 5

9. Describe the construction and working of a horizontal axis wind machine with a neat sketch. 10

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