

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

Term-End Examination

June, 2026

MRW-003 : RENEWABLE ENERGY SYSTEM

Time : 3 Hours

Maximum Marks : 70

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

(ii) All questions carry equal marks.

1. (a) Discuss in brief the ultimate and proximate analysis of coal. 5
- (b) Describe the principle of solar Photovoltaic Energy Conversion. Draw a schematic layout of components. 5
2. (a) With the help of a diagram, describe the working of Pyranometer. 5
- (b) Describe the steam reforming process of hydrogen production. 5

3. (a) What are heliostats ? Discuss the working of central tower receiver using heliostat mirrors. 5
- (b) Discuss the working of hydrogen-oxygen fuel cell. 5
4. Explain the momentum theory in wind power generation. Give the classification of rotors used for wind generation. 10
5. Describe constructional details and working of a biogas plant. 10
6. (a) What is wave energy ? How it can be used for power generation ? 5
- (b) Discuss the working principle of ocean thermal energy conversion systems. 5
7. What is geothermal energy ? Explain the working principle of a geothermal power plant with the help of a neat sketch. 10
8. With a neat layout, explain the working of a hydroelectric power plant. 10

9. Atmospheric air having the wind velocity of 20 m/s has the density of 1.22 kg/m^3 at high altitude where the wind mill is installed. The rotor diameter is 20 m and it runs at 60 rpm. The actual efficiency of wind mill is 35%. Find the actual power produced and the maximum torque and axial thrust on turbine shaft. 10
10. Write short notes on any *four* of the following : $4 \times 2.5 = 10$
- (i) Energy storage systems
 - (ii) Working of solar pond
 - (iii) Cogeneration plant
 - (iv) Nuclear fission
 - (v) Properties of gaseous fuel.

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