No. of Printed Pages : 3 **MRWE–002**

MASTER OF SCIENCE

(RENEWABLE ENERGY AND ENVIRONMENT) (MSCRWEE)

Term-End Examination

June, 2025

MRWE-002 : ENERGY STORAGE

Time : 3 Hours *Maximum Marks : 70*

Note : *Attempt any* ***seven*** *questions. All question carry equal marks.*

1. Discuss the significance of energy storage in the context of renewable energy. 10

2. Explain in detail how pumped hydroenergy storage works. Also discuss its suitability for large scale energy storage. 10

3. Describe the role of control systems in flywheel energy storage system. 10

4. Explain the environmental considerations and safety concerns associated with chemical energy storage systems. 10

5. Analyse the economic aspects of hydrogen energy storage including the costs associated with storage technologies, infrastructure development and the potential for cost reduction in future. 10

6. What is a fuel cell and how does it work ? What is the difference between a fuel cell and a battery ? 10

7. (a) What are the factors that need to be considered while designing phase change materials ? 5

   (b) Explain the primary purpose of solar energy storage in a grid connected solar system. 5

8. Discuss the design considerations, benefits and challenges associated with integrating sensible heat storage system in commercial buildings for space heating and cooling applications. 10

9. Write short notes on any *four* of the following : 2.5×4=10

   (a) Energy conservation through Latent Heat Thermal Energy Storage (LHTES) system

   (b) Metal hydrides

   (c) Advanced Batteries

   (d) Compressed air energy storage

   (e) Superconducting magnetic energy storage

   (f) Electrochemical energy storage

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