No. of Printed Pages : 4 **MRWE–001**

MASTER OF SCIENCE
(RENEWABLE ENERGY AND ENVIRONMENT) (MSCRWEE)
Term-End Examination
June, 2025

MRWE-001 : NANOTECHNOLOGY IN ENERGY AND ENVIRONMENT

Time : 3 Hours *Maximum Marks : 70*

Note : *Answer any* ***seven*** *questions. All questions carry equal marks.*

1. (a) Define Nanotechnology and discuss its future and challenges. 5

   (b) Discuss the various tools and techniques used for synthesizing of nanomaterials. 5

2. (a) What are the Nano manufacturing methods ? Explain any *one* method. 5

   (b) Explain the working of scanning electron microscope with a suitable diagram. 5

3. (a) What is a Battery ? How is nanotechnology applied in a Battery ? List out the applications of battery. 5

   (b) What is a Nanomachine ? Discuss its various applications. 5

4. (a) How do you apply (or) use nanotechnology into energy sector ? Explain in brief. 5

   (b) What is sputtering ? Explain the process of sputtering with a suitable diagram. 5

5. (a) Describe the integration and performance of micro-fuel cell system. 5

(b) What is green house effect ? Explain in brief various steps to design solar green house. 5

6. (a) Explain the working of NP-based optical sensors. 5

(b) What is the purpose of solar energy storage system ? Write the types and relative advantages of solar energy storage system. 5

7. (a) How is the pollution reduced by using Nanotechnology and Nanomaterials ? Explain in brief. 5

(b) How Green Nanotechnology could be developed ? Explain in detail. 5

8. (a) How do you monitor the various environmental factors by using sensors ? Explain briefly. 5

(b) How do you prevent the pollution by using Nanotechnology ? Explain with suitable examples. 5

9. Write short notes on any *two* of the following : 5+5

   (a) Nano-Micro Silicon (Si) composite structure

   (b) Nanosensor

   (c) Green nanomaterials

   (d) Remediation process

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