

Assignment Booklet

MSCRWEE Programme

M.Sc (Renewable Energy and Environment)

First Semester	
MRW-001	Energy Conversion
MRW-002	Heat Transfer
MST-001	Foundation of Mathematics and Statistics
MED-003	Energy and Environment



***SCHOOL OF ENGINEERING & TECHNOLOGY
INDIRA GANDHI NATIONAL OPEN UNIVERSITY***

Maidan Garhi, New Delhi – 110 068

JANUARY 2025

Dear Student,

Please read the information on assignments in the Programme Guide that we have sent you after your enrolment. A weightage of 30%, as you are aware, has been earmarked for continuous evaluation, **which would consist of one tutor-marked assignment** for this Programme. The assignment for MSCRWEE (first semester) has been given in this booklet.

Instructions for Formatting Your Assignments

Before attempting the assignment, please read the following instructions carefully:

1) On top of the first page of your answer sheet, please write the details exactly in the following format:

ENROLLMENT NO :

NAME :

ADDRESS :

.....

.....

PROGRAMME CODE:

COURSE CODE:

COURSE TITLE:

STUDY CENTRE:

DATE:

**PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE
EVALUATION AND TO AVOID DELAY.**

- 2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.
- 3) Leave 4 cm margin on the left, top and bottom of your answer sheet.
- 4) Your answers should be precise.
- 5) **These assignments submitted should be hand written in your own hand writing.**

We strongly suggest that you should retain a copy of your answer sheets.

- 6) **You cannot fill the Exam Form without** submission of the assignments. So solve it and **submit it at the earliest**. If you wish to appear in the **TEE, June 2025**, you should submit your TMAs by **April 30, 2025**. Similarly, if you wish to appear in the **TEE, December 2025**, you should submit your TMAs by **September 30, 2025**.
- 7) Assignments will be submitted at **your respective regional centre**.

We wish you good luck!

Assignment -1
(To be done **after** studying the course material)

Course Code: MRW-001
Course Title: Energy Conversion
Assignment Code: MRW-001/TMA/2025
Maximum Marks: 100

Last Date of Submission: April 30, 2025 (For June TEE), September 30, 2025 (For December TEE)
Note:

- 1. For any question worth 5 marks the word limit is 200 words, for a 10 mark question it is 350 words.**
 - 2. All questions are compulsory. All questions carry equal marks.**
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|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Q.1 | a) A six-pole induction motor is running at a speed of 980 rpm when it is fed from 50 Hz source. Find the slip with which the motor is running and the frequency of the rotor current. | 5 |
| | b) Discuss the integrated power generating system for rural areas. | 5 |
| Q.2 | a) Enlist the various applications of a solar PV system | 5 |
| | b) What is Vacuum Efficiency? What are the factors on which vacuum efficiency depends? | 5 |
| Q.3 | a) Discuss the characteristics of bagasse. How is it possible to convert bagasse into liquid fuel? | 5 |
| | b) Describe the various zones of gas production reactions. | 5 |
| Q.4 | a) Determine the theoretical amount of air required for the complete combustion of coal with the following composition: 5 C = 60%, H = 5%, O = 4.8%, S = 0.2%, Nitrogen = 2%, Moisture = 10% and Ash = 18%. | 5 |
| | b) A hydroelectric station is to be designed for a catchment area of 102 sq. km, runoff of 70% and the average rainfall of 127 cm. The head available is 381 m. What power can be developed if the overall efficiency of the plant is 80%? | 5 |
| Q.5 | Explain the working and construction of a simple gas turbine power plant. | 10 |
| Q.6 | a) Discuss the various stages of energy conversion in railway transportation system. | 5 |
| | b) What is combustion efficiency? What are the various factors on which it depends? | 5 |
| Q.7 | a) Classify the petroleum. Discuss the characteristics of ideal gasoline. | 5 |
| | b) What is catalytic cracking? Discuss its advantages over thermal cracking. | 5 |
| Q.8 | a) Describe the working principle of electrostatic precipitator. | 5 |

- b) What is the effect of fly ash on environment? What is the function of spray tower in removing fly ash? 5

Q.9 Write short notes on the following:

- a) Hydraulic Sluicing Element 5
- b) Magneto hydrodynamic Power Generation 5
- c) Bioenergy 5
- d) Surge Tanks 5