CETM-2024

ASSIGNMENT BOOKLET

CERTIFICATE IN ENERGY TECHNOLOGY AND MANAGEMENT (CETM)

Last date for submission:

15th May, 2024
30th September, 2024

School of Engineering and Technology
Indira Gandhi National Open University
Maidan Garhi, New Delhi-110 068

Dear Student,

We advise you to go through your programme guide carefully and read the section pertaining to assignments. A weightage of 30 percent, as you are aware, has been earmarked for continuous evaluation which would consist of **one tutor-marked assignment** for each of OEY 001, OEY 002 and OEY 003 of this course. You have to score a minimum of 40 marks out of 100 marks in each of the assignments. **Submit your assignment response at your Study Centre.**

Instructions for Formatting Your Assignments

Before attempting the assignment please read the following instructions carefully.

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

ENROLMENT NO: ……

NAME: ……

ADDRESS: ……

……

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COURSE CODE: …….

COURSE TITLE: …….

ASSIGNMENT NO.: ……..…

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) While solving problems, clearly indicate the question number along with the part being solved. Be precise. Recheck your work before submitting it.

6) The assignment should be in your own handwriting. Typed assignments will not be accepted.

Answer sheets received after the due date shall not be accepted.

We strongly feel that you should retain a copy of your assignment response to avoid any unforeseen situation and append, if possible, a photocopy of this booklet with your response.

We wish you good luck.

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

Course Code: OEY 001
Assignment Code: OEY-001/TMA/2024
Maximum Marks: 100

Note:

1. In any question, whenever we ask you to suggest an activity we expect you to give one other than those covered in the units.

2. For any question worth 5 marks the word limit is 200 words, for a 10 mark question it is 350 words, and for a 15 mark question it is 500 words.

3. All questions are compulsory. All questions carry equal marks.

Q.1 Describe in detail, any three conventional energy resources.

Q.2 Discuss the advantages and disadvantages of renewable energy.

Q.3 Define energy conversion efficiency. Also state the first law of thermodynamics and mention its significance. An IC engine has an input of 500KWh. through fuel , Energy equivalent to 350 KWh is utilized for running a motor. What is the energy conversion efficiency?

Q.4 Define charcoal and discuss its prominent properties.

Q.5 Differentiate between low, medium and high temperature solar collectors.

Q.6 Explain, in detail the operation and maintenance of a biogas plant.

Q.7 Taking into account your everyday life, give your detailed suggestions on how much energy you can save everyday and by what means you can do so?

Q.8 Name some bio fuels and explain the 1st and 2nd generation bio-fuels.

Q.9 Discuss, in detail the characteristics of lignite and anthracite.

Q.10 Write short notes on the following:
a) Wind energy
b) Tidal energy

Assignment-2
(To be done **after** studying the course material)

Course Code: OEY 002

Assignment Code: OEY-002/TMA/2024

Maximum Marks:100

Note:

1. In any question, whenever we ask you to suggest an activity we expect you to give one other than those covered in the units.

2. For any question worth 5 marks the word limit is 200 words, for a 10 mark question it is 350 words, and for a 15 mark question it is 500 words.

3. All questions are compulsory. The marks of each question are indicated against it.

Q 1. (a) What is Solar Constant? Also write the advantages of selective surface. 10

(b) Explain the principles and working of solar cooker. Also highlight its features over conventional cooker. 10

Q.2 (a) Explain working of Solar Lantern with proper sketch. 10

(b) Draw and explain current –voltage characteristics of a solar cell. What is packing factor? 10

Q.3 (a) Explain schematic flow sheet for high rate farm scale digester. 10

(b) Explain floating drum biogas digester with neat diagram. Also write its advantages and disadvantage 10

Q.4. (a) Explain the Trombe wall in detail. Also explain effect of window orientation. 10

(b) Classify the different categories of solar building system and also explain main features of three main type of building. 10

Q.5 a) Explain Solar Drying System with neat schematic diagram. Also write its usefulness. 10

b) Write short notes on the following:
(i). Solar active and solar passive buildings 05
(ii). Green House Effect 05

Assignment-3

(To be done **after** studying the course material)

Course Code: OEY 003
Assignment Code: OEY-03/TMA/2024
Maximum Marks: 100

Note:

1. In any question, whenever we ask you to suggest an activity we expect you to give one other than those covered in the units.
2. For any question worth 5 marks the word limit is 200 words, for a 10 mark question it is 350 words, and for a 15 mark question it is 500 words.
3. All questions are compulsory.

Q.1 Describe the energy conservation opportunities for residential and commercial application. 10

Q.2 Explain the methods of Energy Audit with suitable examples. 10

Q.3 a) Explain the utility and features of the energy audit equipment used for the measurement of electrical parameters. 05

b) Explain the working principle of thermocouples. 05

Q.4 A co-generation plant installation is expected to reduce a company's annual energy bill by Rs.24 lakhs. If the capital cost of the new cogeneration installation is Rs.90 lakhs and the annual maintenance and operating costs are Rs. 6 lakhs, what will be the expected payback period for the project? 10

Q.5 Classify the energy conservation measures applicable in steel industry. 10

Q.6 Explain in brief Energy efficiency versus Energy conservation. Write step wise procedure to calculate Boiler efficiency. 10

Q.7 A three phase induction 75 kW motor operates at 55 kW. The measured voltage is 415V and Current 80 amp. Calculate the power factor of the motor. 10

Q.8 The operating power factor during audit is 0.7. Total load connected is 180 kW. Determine the rating of power capacitors for improving the power factor to 0.9. 10

Q.9 Write short notes on any four of the following: 20

a) Sankey Diagram
b) Waste heat recovery
c) Combustion analyser
d) Rural energy planning
e) Renewable energy systems