

**CETM-2016**

**ASSIGNMENT BOOKLET**

**CERTIFICATE IN ENERGY TECHNOLOGY AND MANAGEMENT  
(CETM)**

**Last date for submission:**

**30<sup>th</sup> March for January session**

**30<sup>th</sup> September for July session**



**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 per cent, 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.**

A feedback form is enclosed with this assignment. Please complete it after solving this assignment and send it to the Course Coordinator (CETM) on the address specified on the feedback form.

### 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:

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**ENROLMENT NO:** .....

**NAME:** .....

**ADDRESS:** .....

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**COURSE CODE:** .....

**COURSE TITLE:** .....

**ASSIGNMENT NO.:** .....

**STUDY CENTRE:** ..... **DATE:** .....

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**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.

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/2016**  
**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.
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Q.1. Describe in detail, any three conventional energy resources.

Q.2. Explain the principle of tidal energy and its advantages and disadvantages

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

Q.4. What is greenhouse effect? Explain the major contributors which cause this effect.

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 biofuels and explain the 1<sup>st</sup> and 2<sup>nd</sup> 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) Nuclear energy

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

**Course Code: OEY 002**

**Assignment Code: OEY-002/TMA/2016**

**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.
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**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.

(b) Explain floating drum biogas digester with neat diagram. Also write its advantages and disadvantage 20

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

(b) Classified 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) Define the followings: 10

(i) Moisture Content (Dry basis)

(ii) Humidity

(iii) Payback period

(iv) Drying Efficiency

(v)Capital recovery factor

### Assignment-3

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

**Course Code: OEY 003**  
**Assignment Code: OEY-03/TMA/2016**  
**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.
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1. Describe the energy conservation opportunities for residential and commercial application.
2. List out the advantage, limitations and application of total energy system.
3. Explain in brief the energy conservation measures in Paper and or Iron and Steel Industry.
4. Discuss any five good housekeeping measures to conserve electricity in your home, approximately give the units of energy saved.
5. What is energy Audit? Explain various types of energy audit techniques.
6. 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?
7. Explain in brief Energy efficiency versus Energy conservation. Write step wise procedure to calculate Boiler efficiency.
8. (a) A three phase induction 75 kW motor operates at 55 kW. The measured voltage is 415 V, Current 80 A. Calculate the power factor of the motor.  
  
(b)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.
9. Describe two devices to measure pressure.
10. Write short notes on any four of the following:
  - a) Sankey Diagram
  - b) Waste heat recovery
  - c) Combustion analyser
  - d) Rural energy planning
  - e) Renewable energy systems