

**M.Tech. Mechanical Engineering Design (CBCS Pattern) Semester-III**  
**MED32(C) - Open Elective - Renewable Energy Technology**

P. Pages : 1

Time : Three Hours



**GUG/W/24/14205**

Max. Marks : 70

- Notes :
1. All questions carry equal marks.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.
  4. Illustrate your answers wherever necessary with the help of neat sketches.
  5. Attempt **any five** questions.

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|----|------|---|----|
| 1. | a)   | Describe the non-conventional energy sources relevant in India.                         | 7  |
|    | b)   | Discuss the energy scenario in the Indian context.                                      | 7  |
| 2. | a)   | Write a short note on the Pyranometer and Pyrliometer.                                  | 8  |
|    | b)   | Explain the factors affecting the performance of a flat plate collector.                | 6  |
| 3. | a)   | Define the terms related to solar radiation:  | 6  |
|    | i)   | Solar constant  |    |
|    | ii)  | Clarity index   |    |
|    | iii) | Solar Altitude  |    |
|    | iv)  | Zenith angle  |    |
|    | v)   | Surface azimuth angle   |    |
|    | vi)  | Slope or tilt angle.  |    |
|    | b)   | Explain the flat plate solar collector with a neat sketch.                              | 8  |
| 4. | a)   | Explain Solar air heaters. State the advantages and disadvantages of solar air heaters. | 8  |
|    | b)   | Explain the radioactive properties and characteristics of solar collector material.     | 6  |
| 5. | a)   | Write a short note on Photo-voltaic cells.  | 7  |
|    | b)   | Write a note on photovoltaic conversion in renewable energy systems.                    | 7  |
| 6. | a)   | What are the sources of wind? State advantages and disadvantages of wind energy.        | 7  |
|    | b)   | Compare vertical axis an horizontal axis wind machines.                                 | 7  |
| 7. | a)   | What is the principle of MHD power generation? How are MHD systems classified?          | 7  |
|    | b)   | Explain basic components of a nuclear power plant.                                      | 7  |
| 8. |      | Write short note on <b>any two</b> .  | 14 |
|    | i)   | Cost-benefit analysis of renewable energy system.                                       |    |
|    | ii)  | Clean development mechanism.  |    |
|    | iii) | Biomass resources.  |    |

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