Code: P18MEE12

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HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE
(AUTONOMOUS)
IV B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH-2023
RENEWABLE SOURCES OF ENERGY
(ME Branch)

Time: 3 hours Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

**PART-A**

Answer **all** the questions in Part-A (**5X2=10M**)

| Q.No. | | Questions | Marks | CO | KL |
|---|---|---|---|---|---|
| 1. | a) | Explain the principle of conversion of solar energy into heat. | [2M] | 1 | 1 |
| | b) | Explain briefly about the conventional Energy Sources and un–conventional energy Sources | [2M] | 2 | 1 |
| | c) | Define concentration ratio of solar collector. | [2M] | 3 | 1 |
| | d) | A wind turbine has a rated power of 100 kW and rated speed of 12 m/s. Estimate its power output in a wind speed of 9 m/s | [2M] | 4 | 2 |
| | e) | Distinguish between large, small and Micro hydro systems | [2M] | 5 | 1 |

**PART-B**

**Answer One Question from each UNIT (5X10=50M)**

| Q.No. | | Questions | Marks | CO | KL |
|---|---|---|---|---|---|
| | | UNIT-I | | | |
| 2. | a) | Explain in brief the need for exploiting renewable energy sources. | [5M] | 1 | 1 |
| | b) | List the different forms of Renewable Energy sources. | [5M] | 1 | 1 |
| | | OR | | | |
| 3. | a) | Illustrate various forms of renewable energy. | [5M] | 1 | 3 |
| | b) | Explain the Necessity of Energy Storage in present Scenario | [5M] | 1 | 1 |
| | | UNIT-II | | | |
| 4. | a) | Discuss about the features of different types of concentrating type solar | [5M] | 2 | 4 |
| | b) | List the advantages and disadvantages of Solar PV systems | [5M] | 2 | 1 |
| | | OR | | | |
| 5. | a) | Explain the working of Pyranometer with a neat circuit | [4M] | 2 | 1 |
| | b) | Calculate the angle of incidence of beam radiation on a plane surface, tilted by 40° from horizontal plane and pointing 30° west of south located at Mumbai at 1:30 PM (IST) on 15th November. The longitude and latitude of Mumbai are 72° 49'E and 18° 54'N respectively. The standard longitude for IST is 81° 44'E. | [6M] | 2 | 3 |
| | | UNIT-III | | | |
| 6. | a) | Describe with a neat sketch the working of a wind energy conversion system (WECS) with its main components. | [5M] | 3 | 4 |
| | b) | Give a brief description on types of wind turbines. | [5M] | 3 | 1 |
| | | OR | | | |
| 7. | a) | What are the main advantages in use of biogas? What are its main constituents and explain them? | [5M] | 3 | 1 |
| | b) | Compare and contrast the biomass and biogass | [5M] | 3 | 1 |
| | | UNIT-IV | | | |

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| 8. | | What are the main advantages and disadvantages of OTEC system? And explain the various technologies available for OTEC. | [10M] | 4 | 1 |
| | | OR | | | |
| 9. | a) | Evaluate the environmental aspects of geothermal energy in detail | [5M] | 4 | 3 |
| | b) | What is the source of tidal energy? What is the minimum tidal range required for the working of a tidal plant? | [5M] | 4 | 1 |
| | | UNIT-V | | | |
| 10. | a) | Write short notes on the following:<br>i) Pyrolysis ii) Fuel Cell. | [6M] | 5 | 1 |
| | b) | Explain the principle of ionization with respect to MHD. | [4M] | 5 | 1 |
| | | OR | | | |
| 11. | a) | Describe the classification of fuel cell. With a neat sketch explain the working of fuel cell | [5M] | 5 | 4 |
| | b) | Explain the principle of operation of an alkaline fuel cell with the aid of a diagram | [5M] | 5 | 1 |

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