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MRW-004

MASTER OF SCIENCE (RENEWABLE ENERGY AND ENVIRONMENT)

(MSCRWEE)

Term-End Examination

December, 2023

MRW-004 : ENERGY MANAGEMENT

Time : 3 Hours *Maximum Marks : 70*

Note : *(i) Attempt any **seven** questions.*

(ii) All questions carry equal marks.

(iii) Use of scientific calculator is permitted.

(iv) Assume suitable data, if missing, any.

1. (a) What is the role of Energy Manager ? 5

   (b) Explain the need of Energy Audit. 5

2. (a) Explain about any ***two*** temperature measuring devices. 5

   (b) Write down the steps required to conduct energy audit of your home. 5

P. T. O.

3. (a) In a non-flow process which is carried out on 6 kg of a substance, there was an energy decrease of 70 kJ/kg and a work transfer from the substance of 85 kJ/kg. Determine the heat transfer and state whether it is gain or loss. 5

   (b) State the Kelvin-Planck's statement of second law and explain its significance in thermodynamic system. 5

4. (a) Describe the various types of power in electrical circuits. 5

   (b) Explain the constructional features of DC machine with a neat sketch. 5

5. Distinguish between any ***four*** of the following : 4×2.5=10

   (a) Microscopic and Macroscopic approach

   (b) Intensive and Extensive property

   (c) Open circuit test and Short circuit test

   (d) Earth leakage circuit breaker (ELCB) and Molded case circuit breaker

   (e) Short-term and Long-term energy conservation measures

   (f) Radial system and Ring system

6. (a) Explain the important characteristics of distributed generation systems. 5

   (b) Explain the significance of power factor in energy conservation. How is power factor improved ? 5

7. (a) Discuss the various energy conservation measures important in a steel industry. 5

   (b) A 3-HP motor was found to be working with 56% load. What could be the right size of energy efficient motor, energy saved and payback period if the motor is working 10 hrs./day and 300 days/year. The cost of electricity is ₹ 5/kWh. 5

8. (a) Discuss the environmental aspects of energy conversion. 5

   (b) Define the following terms : 5

   (i) System

   (ii) Boundary

   (iii) Work

   (iv) Exergy

   (v) Enthalpy

9. Write short notes on any ***four*** of the following : 2.5×4=10

   (a) Energy efficient lighting

   (b) Desert cooler

   (c) Sankey diagram

   (d) Zeroth law of thermodynamics

   (e) DC shunt motor

   (f) Operation of the distributed generation