MRW-001

MASTER OF SCIENCE (RENEWABLE ENERGY AND ENVIRONMENT) (MSCRWEE)

Term-End Examination

December, 2022

MRW-001 : ENERGY CONVERSION

Time : 3 hours *Maximum Marks : 70*

*Note : Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) A six-pole induction motor is running at a speed of 980 rpm when it is fed from 50 Hz source. Find the slip with which the motor is running and the frequency of the rotor current.

   (b) Discuss the integrated power generating system for rural areas. *5+5=10*

2. (a) Explain briefly the diffusion combustion process.

   (b) Discuss the characteristics of gaseous fuels. *5+5=10*

3. (a) Enlist the various applications of a solar PV system.

   (b) Describe the working principle of wind energy system for lifting water. *5+5=10*

4. Distinguish between any *four* of the following : $4 \times 2\frac{1}{2} = 10$

   (a) Natural circulation type solar water heater and Forced circulation type solar water heater

   (b) 3-phase induction motor and 1-phase induction motor

   (c) Thermoelectric energy conversion and Photoelectric energy conversion

   (d) Proximate analysis and Ultimate analysis

   (e) Octane number and Cetane number

   (f) Open cycle gas turbine and Closed cycle gas turbine

5. (a) Describe the working of a parallel flow jet condenser.

   (b) What is Vacuum Efficiency ? What are the factors on which vacuum efficiency depends ? *5+5=10*

6. (a) Describe the reheat steam cycle, with the help of a PV diagram.

   (b) Briefly explain the working principles of any two types of compressors. *5+5=10*

7. (a) Discuss the characteristics of bagasse. How is it possible to convert bagasse into liquid fuel ?

(b) Describe the various zones of gas production reactions. *5+5=10*

8. (a) Describe the working principle of Run-off river plants without pondage.

(b) What are the various particulate emission control techniques ? Discuss their relative advantages and limitations. *5+5=10*

9. Write short notes on any *four* of the following : $4 \times 2\frac{1}{2} = 10$

(a) Hydraulic Sluicing Element

(b) Stoichiometric Air Fuel Ratio

(c) Magnetohydrodynamic Power Generation

(d) Briquetting

(e) Bioenergy

(f) Surge Tanks

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