

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

**Term-End Examination**

**December, 2025**

**MRW-001 : ENERGY CONVERSION**

*Time : 3 Hours*

*Maximum Marks : 70*

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

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1. A coal having the following composition in weight % is used in a steam generating furnance : 10

C = 57.7, H<sub>2</sub> = 5.43, O<sub>2</sub> = 33.35, N<sub>2</sub> = 0.80

and Ash = 2.72

Calculate :

(a) Air required for combustion

- (b) The quantity of product of combustion
  - (c) The calorific value of coal
2. Write a brief note on Solar Thermal System to produce hot water. 10
  3. Describe the energy conversion process of electricity generated in a gas fired thermal power station. 10
  4. (a) With the help of a sketch, describe thermoelectric energy conversion system. 5
  - (b) Write a note on Wind-Electric Power Generator. 5
  5. Derive the overall efficiency of a combined gas turbine power plant using PV diagram. 10
  6. (a) Discuss the cracking process of fuels. 5
  - (b) Explain pneumatic conveyor used for coal ash handling with a schematic diagram. 5
  7. Discuss the physical characteristics of Coke and Briquette fuels. 10

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8. (a) Discuss any *two* equipments used for fly ash handling. 5
- (b) Describe the working principle of Base and Peak load plants with percentage of plant power generation. 5
9. (a) Describe the principle of operation of a 2-stroke Diesel engine. 5
- (b) Describe the environmental impact of greenhouse gases. 5
10. Explain any *two* of the following in brief : 5+5
- (a) Solar assisted water pumping system
- (b) Difference between DC machine and AC machine from construction viewpoint
- (c) Axial and radial flow double motion reaction turbine
- (d) Stoichiometric air-fuel ratio
- (e) Runoff River Plants

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