

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

Term-End Examination

December, 2025

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

C = 57.7, H₂ = 5.43, O₂ = 33.35, N₂ = 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

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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