No. of Printed Pages : 4

# MRW-001

## MASTER OF SCIENCE (RENEWABLE ENERGY AND ENVIRONMENT)

## (MSCRWEE)

## Term-End Examination

## June, 2022

### MRW-001 : ENERGY CONVERSION

*Time : 3 Hours* *Maximum Marks : 70*

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

*(ii) Each question carries equal marks.*

*(iii) Use of scientific calculator is permitted.*

1. Distinguish between any ***four*** of the following :

$4 \times 2\frac{1}{2} = 10$

(a) Motor and generator

(b) Coal fired power plant and diesel engine power plant

(c) Beam radiation and diffused radiation

(d) Tidal energy and ocean thermal energy

(e) Axial flow turbine and radial flow turbine

(f) Surface type condenser and evaporative type condenser

2. Explain the working and construction of a simple gas turbine power plant. 10

3. (a) Classify the petroleum. Discuss the characteristics of ideal gasoline. 5

(b) What is catalytic cracking ? Discuss its advantages over thermal cracking. 5

4. (a) Determine the theoretical amount of air required for the complete combustion of coal with the following composition : 5

C = 60%, H = 5%, O = 4.8%, S = 0.2%, Nitrogen = 2%, Moisture = 10% and Ash = 18%.

(b) State the following laws : 5

(i) Law of Lavoisier and Laplace

(ii) Dalton's law

5. (a) A hydroelectric station is to be designed for a catchment area of 102 sq. km, runoff of 70% and the average rainfall of 127 cm. The head available is 381 m. What power can be developed if the overall efficiency of the plant is 80% ? 5

(b) Classify the water turbines on the basis of the name of originator. How are the performance of water turbines expressed ? 5

6. (a) Explain the process of thermoelectric power generation. 5

(b) What is the scope of geothermal energy in India ? 5

7. (a) Describe the working principle of electrostatic precipitator. 5

(b) What is the effect of fly ash on environment ? What is the function of spray tower in removing fly ash ? 5

8. (a) Discuss the various stages of energy conversion in railway transportation system. 5

   (b) What is combustion efficiency ? What are the various factors on which it depends ? 5

9. Write short notes on any ***two*** of the following : 5 each

   (a) Submerged combustion process

   (b) Biomass energy

   (c) Fire tube boilers

   (d) 2-stroke IC engines