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MRW-006

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

Term-End Examination

December, 2024

**MRW-006 : BIOENERGY CONVERSION AND ITS
UTILIZATION**

Time : 3 Hours

Maximum Marks : 70

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

(ii) All questions carry equal marks.

1. Discuss the various techniques of biomass assessment. 10
2. Describe the various sources of solid biomass waste. 10
3. Explain the gasification process for conversion of biomass feedstock to synthesis gas. 10

4. (a) Describe in brief the solvent extraction process. 5
- (b) Explain the biochemical and biological conversion platforms. 5
5. Describe the construction and working of fixed Dome biogas plant with a neat sketch. 10
6. Discuss the transesterification process for biodiesel production. 10
7. Distinguish between any *four* of the following :
4×2.5=10
- (a) Gasification and Pyrolysis
- (b) Membrane separation and Cryogenic separation
- (c) Updraft gasifier and Downdraft gasifier
- (d) Flash point and Pour point
- (e) Fixed bed combustion and Fluidized bed combustion
- (f) Ultimate and Proximate analysis of solid biomass
8. (a) Discuss the various physico-chemical properties of ethanol which make it suitable fuel for Spark Ignition (SI) engines. 5

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- (b) Explain the steam reforming process for hydrogen production. 5
9. (a) Discuss the various challenges in the production of biofuel in India. 5
- (b) What is green hydrogen ? What are its benefits ? 5
10. Write short notes on any *two* of the following :
5+5=10
- (a) National biogas and manure management programme
- (b) Methanol as a fuel
- (c) Biofuel policy
- (d) Structure of enzymes
- (e) Municipal Solid Waste (MSW)

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