

Indian Maritime University
(A Central University, Govt of India)

End Semester Examinations – December 2022

Programme Name: B Tech (ME)

Semester: VII

Subject Code: UG11E3704

Subject Name: Renewable Energy Sources and Applications

Date: 20.12.2022

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
 - (ii) Options, if any, are specified in respective section.
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Section A

(Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.)

1. Biomass is useful to produce _____
a) Chemicals b) Fibres c) Petro chemicals d) Biofuels
2. What are the main products of anaerobic digestion
a) Biogas and bio fertilizers b) Waste water c) Producer Gas d) Glycerine
3. What is the main source for the formation of wind?
a) Uneven land b) Sun c) Vegetation d) Seasons
4. Which type of turbine is commonly used in tidal energy?
a) Francis turbine b) Kaplan turbine c) Pelton wheel d) Gorlov turbine
5. Which of the following is type of non-renewable energy source?
a) Hydro power b) Geothermal energy c) Nuclear energy d) tidal current
6. All conventional energy sources are the examples of _____
a) Centralized energy sources b) Dispersed energy sources
c) Centralized or dispersed energy source d) Renewable energy sources
7. Maximum flux density (irradiance) of solar energy is _____
a) 1 KW/m² b) 700 W/m² c) 500 W/m² d) 1 W/m²

8. Thermosyphon circulation of water heating system depends on _____
a) Pump capacity of water circulation b) Density difference of hot and cold water
c) Environmental effect d) Thermal effect of solar energy
9. Low temperature solar power plant works on temperature _____
a) 90-degree b) 400-degree c) more than 400-degree d) less than 90-degree
10. Bio diesel is produced by the _____ of the vegetable oil.
a) Fermentation b) Distillation c) Transesterification process d) Rectification

Section B

(Five Questions of 02 Marks each)

11. Write the impact of wind turbine on wildlife.
12. Briefly describe the reason for tide
13. What are the components of solar radiation?
14. Define - Altitude angle and zenith angle
15. Define - Photovoltaic effect.

Section C

(Seven Questions of 10 Marks each of which any 05 questions to be answered.)

16. Give the classification of wind turbines and with the help of a neat sketch, explain the different types of rotors used in wind turbines.
17. What is geothermal energy? Explain with neat diagram how electricity is produced from the flashed steam geothermal power plant.
18. What do you mean by grid connected solar photovoltaic system?. Explain with the help of diagram.
19. Draw and explain solar pond. What are the different parts of solar flat plate collector?
20. Explain with the help of block diagram how pyranometer and pyrliometer are used for measurement of solar radiation?
21. State and explain the various types of biomass conversion technologies.
22. State the classification of Biogas plant and with the help of neat sketch explain the working of floating drum type biogas plant (KVIC- Model).