

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations– December 2023**

**Programme Name: B Tech (ME)**

**Semester: 7**

**Subject Code: UG11E3704**

**Subject Name: Renewable Energy Sources and Applications**

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Date: 15.12.2023

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

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General Instructions

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

**Section A**

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

1. A solar cell converts light energy into \_\_\_\_\_
  - (a)Electrical energy
  - (b)Thermal energy
  - (c)Sound energy
  - (d)Heat energy
2. Material used for making solar cell is \_\_\_\_\_
  - (a)Silicon
  - (b)Carbon
  - (c)Sodium
  - (d)Magnesium
3. The efficiency of a solar cell may be in the range
  - (a)2 to 5%
  - (b)10 to 15%
  - (c) 30 to 40%
  - (d)70 to 80%
4. What is the main source for the formation of wind?
  - (a) Uneven land
  - (b) Sun
  - (C) Vegetation
  - (d) Seasons

5. Which of the following source of energy caused by uneven heating of earth's surface?

- (a) wind
- (b) solar
- (c) biomass
- (d) geothermal

6. Wind energy is harnessed as \_\_\_\_\_ energy with the help of windmill or turbine.

- (a) mechanical
- (b) solar
- (c) electrical
- (d) heat

7. In dry steam hydrothermal plant, we use

- (a) Carnot cycle
- (b) Brayton cycle
- (c) Rankine Cycle
- (d) None of the above

8. The efficiency of geothermal plant is about

- (a) 5%
- (b) 15%
- (c) 25%
- (d) 35%

9. In terms of predictability, tidal energy \_\_\_\_\_ solar and wind.

- (a) is more predictable than
- (b) is less predictable than
- (c) has similar predictability like
- (d) cannot be predicted unlike

10. Which one of the following is an example of starch crops biomass feed stocks?

- (a) Sugar cane
- (b) Wheat straw
- (c) Corn stover
- (d) Orchard prunings

### **Section B**

Five Questions of 02 Marks each

11. What is extraterrestrial radiation (ETR)?

12. What is Fill Factor of a solar cell?

13. Why the earth's inner core is not liquid?

14. How does an OTEC plant work?

15. Define renewable energy.

### **Section C**

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

16. Describe Solar Thermal system with forced circulation.
17. Discuss onshore and offshore wind farms.
18. Explain Geothermal HDR Power Plant.
19. Describe following ocean wave power plants: Float ball systems, Chamber systems, Tapchan systems.
20. Discuss Ocean Current Power Plants.
21. Discuss the following Bio-Fuels: Bio - oil, Biodiesel, Bioethanol, Biogas
22. Discuss different Fuel-Cells.

