

KAMARAJ COLLEGE (Autonomous)
Accredited with A+ Grade by NAAC
(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)
THOOTHUKUDI – 628 003

(5 Pages)

Reg. No:

Question. Code No : 2400333

Sub Code : 24PEPH11

PG Degree - End Semester Examinations, November 2024

First Semester

M.Sc. PHYSICS

Elective - ENERGY PHYSICS

(For those who joined in July 2024 onwards)

Time : 3 Hours

Maximum : 75 Marks

PART A – (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

1. Which of the following is a disadvantage of fossil fuels?
(a) Abundant supply (b) Low cost
(c) Sustainable (d) Environmental pollution

2. ----- energy storage technology has the highest energy density
(a) batteries (b) Capacitors
(c) Fly wheels (d) Hydrogen fuel cells
3. What is the minimum depth required for OTEC systems
(a) 500 m (b) 1000 m
(c) 2000 m (d) 3000 m
4. Which is the primary source of tidal energy?
(a) wind (b) Ocean current
(c) Solar radiation (d) Gravitational pull of the moon
5. What drives the wind turbine blades?
(a) Lift force (b) Drag force
(c) Gravity (d) Friction
6. The wind turbine component that converts mechanical energy into electrical energy is-----
(a) Generator (b) Gear box
(c) Blades (d) Tower
7. ----- digestion process produces biogas?
(a) Aerobic (b) Anaerobic
(c) Both (d) None
8. What is the approximate energy content of 1 m³ of biogas?
(a) 5-6 kWh (b) 10 -12 kWh
(c) 15 -20 kWh (d) 20 -25 kWh
9. What is the relationship between voltage and current in a solar cell?
(a) Constant (b) Non linear

- (c) Directly proportional (d) Inversely proportional
10. Give the unit of measurement for solar energy
- (a) J/m (b) W/m²
- (c) Solar irradiance (d) J/m²

PART B - (5X5=25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

11. (a) Distinguish between conventional and non-conventional energy sources.

(OR)

(b) What are fuel cells? Mention their advantages?

12. (a) What is the basic principle of tidal power generation?

(OR)

(b) Mention the challenges and limitations of ocean energy harnessing.

13. (a) Give the advantages and disadvantages of wind energy.

(OR)

(b) What are the two broad classification of wind energy conversion (WEC) system?

14. (a) Give a brief note on dry process of biomass conversion.

(OR)

(b) What are the factors affecting in the generation of biogas?

15. (a) Write a short note on Pyrheliometer.

(OR)

- (b) Explain about the photovoltaic conversion of solar energy into electric power.

PART C – (5 × 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 600 words.

16. (a) Give a detailed account of renewable energy and their types.

(OR)

- (b) Mention the prospectus of non-conventional energy sources.

17. (a) Give the principle and functioning of OTEC system with a neat sketch.

(OR)

- (b) Discuss the potential applications of tidal energy

18. (a) Describe about wind energy conversion system with their basic components.

(OR)

- (b) Discuss about wind power and wind power coefficient.

19. (a) Explain biogas generation through anaerobic digestion process.

(OR)

- (b) Discuss the advantages and disadvantages of biogas generation.

20. (a) Depict the principle and working of solar pond with neat sketch.

(OR)

(b) Describe the construction and working of solar cooker with neat diagram.