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 : 25E03308 **Sub Code : 24PEPH11**

PG Degree - End Semester Examinations, April 2025

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. The energy which is not derived from the sun is …….
   (a) Bio mass (b) Fossil Fuels
   (c) Nuclear Energy (d) Geo thermal energy
2. Photovoltaic energy is the conversion of sunlight into

(a) Chemical energy (b) Biogas

(c) Electricity (d) Geothermal energy

3. The working fluid in closed cycle OTEC system is

(a) Oxygen (b) Hydrogen

(c) Water (d) Propane

4. The principle used in the working of OTEC is

(a) Forced convection (b) Heat engine

(c) Joule-Kelvin effect (d) All the above

5. The range of wind speed suitable for wind power generator

(a) 0 to 5 m/s (b) 5 to 25 m/s

(c) 25 to 50 m/s (d) 50 to 75 m/s

6. The part of the windmill that generates electricity is

(a) Turbine (b) Blades

(c) Gear box (d) Tower

7. Which fermentation is involved in microbial digestion of biomass?

(a) Anaerobic (b) Gasoline

(c) Lingo (d) None of the above

8. The chief component of biogas is

(a) Oxygen (b) Carbon-di-oxide

(c) Ethylene (d) Methane

9. Most of the solar radiation received on earth surface is within the range of

(a) 0.25 to 0.4 micron (b) 0.4 to 0.8 micron

(c) 0.6 to 0.95 micron (d) 0.1 to 0.25 micron

10. Absorption of solar radiation at earth's surface occurs due to the presence of

(a) Ozone (b) Water vapour

(c) Carbon – di – oxide (d) All of the above

PART – B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 250 words.

11. (a) What are the merits and demerits of Fossil Fuels?

(OR)

(b) Distinguish between Conventional and Non-Conventional energy sources.

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

(OR)

(b) What is the basic principle of tidal power generation?

13. (a) Explain the basic principle of wind energy conversion.

(OR)

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

14. (a) Explain the principle and process of wood gasification.

(OR)

(b) Write the advantages of aerobic digestion.

15. (a) Explain the working of solar water heater.

(OR)

(b) Write a short note on Pyrheliometer.

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 600 words.

16. (a) Explain in detail about renewable energy sources and mention their advantages and disadvantages.

(OR)

(b) Give a detailed account on non-renewable energy and their types.

17. (a) What are the applications, merits and demerits of tidal energy?

(OR)

(b) Explain the principle, construction and working of Ocean Thermal Energy Conversion (OTEC) system.

18. (a) Explain about the different types of blades and forces in the blades in wind energy conversion system.

(OR)

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

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

(OR)

(b) Compare the wet and dry process of biomass conversion.

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

(OR)

(b) Explain about the photovoltaic conversion of solar energy into electric power and mention their merits and demerits.