

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(3 Pages)

Reg. No:.....

Question Code: 26E01207

Course Code : 24USPH22/25USPH22

UG Degree - End Semester Examinations, April 2026

Second Semester

B.Sc., PHYSICS

Energy Physics

(For those who joined in July 2024 and June 2025 onwards)

Time : 3Hours

Maximum : 75 Marks

PART - A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

CO:1 1. Which of the following is a conventional energy source?

- K:1 (a) Wind energy (b) Solar energy
(c) Tidal energy (d) Coal

CO:1 2. One major demerit of solar energy is:

- K:2 (a) High carbon emission (b) Availability only during daytime
(c) Limited technology (d) Non-availability in deserts

CO:2 3. The ultimate source of solar energy is

- K:1 (a) Moon (b) Wind
(c) Nuclear fusion in the Sun (d) Ocean currents

CO:2 4. The working principle of a photovoltaic (PV) cell is based on

- K:2 (a) Thermoelectric effect (b) Piezoelectric effect
(c) Photoelectric effect (d) Hall effect

CO:3 5. Wind energy is classified as

- K:1 (a) Non-renewable energy (b) Conventional energy
(c) Renewable energy (d) Fossil fuel

- CO:1 6. The device that converts wind energy into electrical energy is
K:1 called:
- (a) Transformer (b) Inverter
(c) Turbine (d) Wind Energy Conversion System
- CO:1 7. Which of the following is a biomass resource?
K:1
- (a) Coal (b) Petroleum
(c) Agricultural residues (d) Uranium
- CO:1 8. Thermal gasification products include
K:2
- (a) Methane only (b) Hydrogen only
(c) Oxygen only (d) CO, H₂, CH₄
- CO:1 9. A battery converts
K:1
- (a) Mechanical energy to heat energy (b) Chemical energy to electrical energy
(c) Heat energy to light energy (d) Electrical energy to chemical energy
- CO:1 10. Lead-acid batteries are widely used in automobiles because they
K:2
- (a) are very lightweight (b) provide high starting current
(c) require no maintenance (d) have no environmental impact

PART - B (5 X 5 = 25 Marks)

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

Answer should not exceed 250 words.

- CO:3 11. (a) Compare conventional and non-conventional energy
K:4 sources.

(OR)

(b) Analyze the different energy storage systems with suitable examples.

- CO:3 12. (a) List the factors affecting solar radiation at the Earth's
K:4 surface.

(OR)

(b) Compare solar pond and solar water heater in terms of working principle, energy storage, advantages and limitations.

- CO:2 13. (a) Discuss the advantages and disadvantages of WECS.

K:3

(OR)

(b) Explain the basic principles of wind energy conversion.

CO:3 14. (a) Differentiate between Biomass and biogas.

K:4

(OR)

(b) Classify biomass gasifier based on its capacity and direction of gas flow.

CO:3 15. (a) Distinguish between fuel cell and battery.

K:4

(OR)

(b) Give the advantages and disadvantages of fuel cell.

PART - C (5 X 8 = 40 Marks)

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

Answer should not exceed 500 words.

CO:4 16. (a) Describe the non-conventional energy sources and their availability.
K:5

(OR)

(b) Discuss the world energy future for conventional energy sources.

CO:3 17. (a) Examine the advantages and disadvantages of solar crop dryers compared to traditional drying methods.
K:4

(OR)

(b) Explain the performance of a photovoltaic cell. Also discuss the factors affecting its efficiency such as temperature, shading, material used and angle of installation.

CO:4 18. (a) Explain the working of Wind Energy Conversion Systems.
K:5

(OR)

(b) Assess the advantages and limitations in tidal energy generation.

CO:5 19. (a) Discuss the factors affecting generation of biogas.
K:6

(OR)

(b) Discuss the advantages and disadvantages of floating drum and fixed dome type plants.

CO:4 20. (a) Discuss any two types of fuel cells.
K:5

(OR)

(b) Explain the working of nickel cadmium battery and its advantages.