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Barasat, Kolkata -700125

Term End Examination 2025-2026
Programme – B.Tech.(EE)-2023
Course Name – Renewable & Non-Conventional Energy
Course Code - PE-EE501C
(Semester V)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Identify gas that is considered a clean alternative fuel for vehicles

a) Nitrogen b) Methane
c) Hydrogen d) Carbon Dioxide

(ii) Identify the disadvantages of renewable energy.

a) High pollution b) Region specific availability
c) High running cost d) Unreliable supply

(iii) Identify the largest amount of installed grid interactive renewable power capacity in India.

a) Wind power b) Solar power
c) Biomass power d) Small Hydro power

(iv) Identify the following area that is preferred for solar power plants.

a) Coastal areas b) Hot arid areas
c) Mountain areas d) High rainfall areas

(v) Indicate the Solar cells are made of

a) Aluminium b) Germanium
c) Silicon d) Cadmium

(vi) Identifying the voltage of solar cells is

a) 0.5 to 1 V b) 1 to 2 V
c) 2 to 3 V d) 4 to 5 V

(vii) Identify the main component of biogas is

a) Carbon monoxide b) Methane
c) Oxygen d) Nitrogen

(viii) Choose the correct option from the following regarding the force is responsible for forcing the global winds towards westerly direction:

a) Coriolis b) Gravitational
c) Centripetal d) Centrifugal

(ix) Select the wind turbine designed to come into operation at a minimum wind speed is called

a) cut in velocity
b) cut out velocity
c) windward
d) upwind

(x) Select the correct option. Flat plate collector absorbs _____

a) Direct radiation only
b) Diffuse radiation only
c) Direct and diffuse both
d) All of these

(xi) Select the correct option. Hydrogen storage under high pressure is usually done in:

a) Glass cylinders
b) Liquid nitrogen tanks
c) Metal hydrides
d) Composite cylinders

(xii) Select type of windmill has better performance.

a) Vertical type windmills
b) Darrieus type machines
c) Magnus effect rotor
d) Horizontal type windmills

(xiii) Choose the correct option. The vertical shaft type wind turbine is also known as:

a) VAWT
b) HAWT
c) CWET
d) VAST

(xiv) Choose the correct option. WECS stands for.

a) Wind energy conversion system
b) Wind engine control system
c) Wind energy combined system
d) . Wind engine comparison system

(xv) Select the major problem with wind energy.

a) Generates energy from wind
b) It is a renewable source of energy
c) Requires large area of land
d) Compact and does not require large area of land

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Explain the advantages, disadvantages and applications of solar water pumping system. (3)
3. Explain the wind characteristics. (3)
4. Define the environmental benefits of biomass energy. (3)
5. Define the advantage of Non-Conventional Energy Sources over Conventional Sources. (3)
6. Give a brief description on the types of wind turbines. (3)

OR

Define various problems associated with MHD power generation. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain the generation of tidal energy. (5)
8. Explain the different methods used for hydrogen storage. (5)
9. Explain the advantages of geothermal energy. (5)
10. Explain thermochemical conversion related to biomass energy. (5)
11. Describe angle of declination with proper diagram. (5)
12. Explain MHD close circuit operation. (5)

OR

Explain IV characteristics of solar cell. (5)

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