

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (R,S) (FT/WP) Examinations April 2026 (2019 Scheme)



Course Code: EET322

Course Name: RENEWABLE ENERGY SYSTEMS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- 1 Explain the importance of green power and its role in reducing environmental pollution and mitigating climate change. (3)
- 2 What are the challenges associated with the utilisation of renewable energy for large-scale power generation? (3)
- 3 Explain the terms a) Zenith angle b) Declination angle c) Tilt angle (3)
- 4 What are the advantages and disadvantages of solar PV system. (3)
- 5 Explain the terms pitch angle, lift force and drag force in the context of wind energy conversion systems. (3)
- 6 Explain the merits and demerits of small hydro power resources. (3)
- 7 Explain the process of biofouling in marine heat exchangers. (3)
- 8 Discuss the key criteria for selecting a site for an Ocean Thermal Energy Conversion power plant. (3)
- 9 What are the factors affecting biogas generation. (3)
- 10 Why is energy storage necessary in modern power system. (3)

PART B

Answer one full question from each module, each carries 14 marks.

Module I

- 11 a) List various pollutants and their harmful effects. (8)
- b) Discuss the role of UNFCCC in addressing global climate change. (6)

OR

- 12 a) Describe the greenhouse effect and discuss its role in global warming and climate change. (8)
- b) List the major conventional sources of energy and discuss their advantages and limitations. (6)

Module II

- 13 a) Describe the construction and working of a Pyrheliometer. (8)
b) With neat diagram explain the working of a solar cell. (6)

OR

- 14 a) With neat diagrams, explain the construction and working principles of a parabolic trough collector and a flat plate collector. (8)
b) Explain the effect of partial shading on the performance of a solar photovoltaic system. (6)

Module III

- 15 a) State and explain Betz's law and its importance in determining the maximum efficiency of a wind turbine. (10)
b) Explain the output power versus wind speed characteristics of a wind turbine. (4)

OR

- 16 a) Explain the concept and working of a variable -speed drive in wind energy conversion systems and its advantages over fixed speed drives. (8)
b) With neat diagram explain the components of wind energy conversion system. (6)

Module IV

- 17 a) List and describe the main components of a tidal power plant. (4)
b) With neat diagram explain the Open cycle and Closed cycle OTEC power generation. (10)

OR

- 18 a) Define tidal energy and explain the principle of tidal power generation (6)
b) Classify tidal power plants based on the type of basin used and explain the working of each type with relevant diagrams. (8)

Module V

- 19 a) Discuss how alcohol is used as an energy source and its significance in alternative fuel technologies. (6)
b) Describe different biomass conversion technologies used to produce energy. (8)

OR

- 20 a) Explain the process of photosynthesis and its role in biomass formation. (6)
b) With a neat diagram, explain the construction, working, and reactions involved in a Phosphoric Acid Fuel Cell. (8)
