

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R, S) / S4 (PT) (R, S) Examination June 2023 (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

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|----|---|-----|
| 1 | List two causes and consequences of global warming. | (3) |
| 2 | Explain the harmful effects of three pollutants affecting the environment. | (3) |
| 3 | Discuss the effect of temperature and insolation on PV cell. | (3) |
| 4 | Explain the terms tilt angle and surface azimuth angle of a solar cell. | (3) |
| 5 | Differentiate between HAWT and VAWT. | (3) |
| 6 | Explain with illustration the power output versus wind speed characteristics of a wind turbine. | (3) |
| 7 | List the advantages and limitations of tidal power plants. | (3) |
| 8 | Where do you find the occurrence of biofouling? What are the methods to control the same? | (3) |
| 9 | Discuss the methods of urban waste to energy conversion. | (3) |
| 10 | Explain the working of fuel cell. | (3) |

PART B*Answer one full question from each module, each carries 14 marks.***Module I**

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|----|--|------|
| 11 | a) List the various non-conventional energy resources. | (4) |
| | b) Explain the advantages and limitation of each non-conventional energy resource. | (10) |

OR

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| 12 | a) Discuss the importance of Green power. | (4) |
| | b) Explain the various classification of energy resources. | (10) |

Module II

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|----|---|-----|
| 13 | a) Describe the various types of solar concentrators. | (9) |
| | b) Explain the working of pyranometer. | (5) |

OR

- 14 a) What is the effect of partial shading on PV cells. (3)
b) With necessary equations and diagrams, explain the characteristics and equivalent circuit of a solar cell. (11)

Module III

- 15 a) Discuss the effect of wind speed and grid conditions in system integration of wind turbines. (4)
b) Discuss the various classification of turbines for small hydro plants. (10)

OR

- 16 a) Explain the wind energy conversion system with variable speed drive. (4)
b) Derive the expression for maximum power extracted by a wind turbine. (10)

Module IV

- 17 a) Describe the principle and various components of tidal power plants. (4)
b) Explain with the help of block diagram, the working of open cycle OTEC plants. (10)

OR

- 18 a) Advantages and limitations of OTEC. (4)
b) Explain with the help of block diagram, the working of closed cycle OTEC plants. (10)

Module V

- 19 a) Explain the factors affecting biogas generation. (4)
b) Discuss the different types of biogas plants. (10)

OR

- 20 a) Explain the necessity of energy storage. (4)
b) Describe the different methods of energy storage. (10)
