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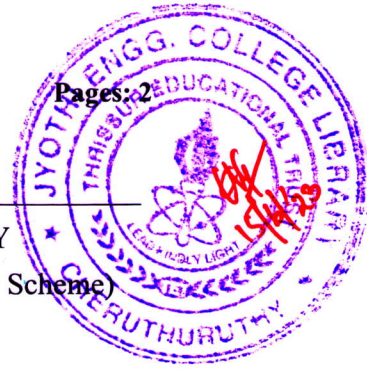
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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Regular Examination June 2023 (2019 Scheme)



Course Code: ECT468

Course Name: RENEWABLE ENERGY SYSTEMS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|---|-----|
| 1 | List any three merits and demerits of renewable energy resources? | (3) |
| 2 | Explain the present status of renewable power generation in India? | (3) |
| 3 | With reference to a solar cell, define (i) Open Circuit Voltage (ii) Short circuit Current (iii) Fill factor (iv) Efficiency? | (3) |
| 4 | What is meant by maximum power point tracking (MPPT) in solar PV system? | (3) |
| 5 | Differentiate between vertical and horizontal axis wind turbines? | (3) |
| 6 | List the advantages and disadvantages of wind energy conversion system? | (3) |
| 7 | What is the need of islanding in power system? | (3) |
| 8 | Explain frequency management in power systems? | (3) |
| 9 | What are the key features of smart grid? | (3) |
| 10 | List any three key functions of distribution management system? | (3) |

PART B

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

Module I

- | | | |
|----|--|-----|
| 11 | a) Explain with a neat sketch, the working of hydropower plant system? | (8) |
| | b) Briefly explain Biomass energy and Bio-fuels? | (6) |

OR

- | | | |
|----|---|------|
| 12 | a) Explain the energy scenario in India. What are the various renewable energy resources relevant in India? | (14) |
|----|---|------|

Module II

- | | | |
|----|--|-----|
| 13 | a) Draw and explain the VI characteristics of a solar cell. How does temperature affect the performance of solar cell? | (7) |
| | b) Explain the working of P V Inverters with DC-DC converter and isolation? | (7) |

OR

- 14 a) Explain stand-alone and grid connected solar PV systems with the help of block diagrams? (8)
- b) Explain tandem solar cell with block diagram? (6)

Module III

- 15 a) With a neat sketch explain the components and principle of operation of a wind turbine? (14)

OR

- 16 a) Explain about System Toroidal Rotor Amplifier Platform (TARP) and Wind amplified rotor platform (WARP)? (8)
- b) Explain the lift and drag forces in wind and its importance in wind power generation? (6)

Module IV

- 17 a) Explain any two islanding detection methods in power systems? (8)
- b) Explain the issues in integrating convertor based sources to the power grid? (6)

OR

- 18 a) Explain the network voltage and power quality management in power systems? (8)
- b) What are the factors influences the PV/WECS on system transient response? Explain? (6)

Module V

- 19 a) With neat diagram explain the working of a smart meter? (8)
- b) List any three the challenges and emerging technologies in smart grid? (6)

OR

- 20 a) Explain the structure and functions of a SCADA system? (8)
- b) Explain any three key components of Smart metering? (6)
