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Register No: …… Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION(R), MAY 2024

Electronics and Communication Engineering

(2020 SCHEME)

Course Code : 20ECT466

Course Name : Renewable Energy Systems

Max. Marks : 100 **Duration:3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Compare conventional and non-conventional energy resources.
2. Discuss the need for renewable energy.
3. Explain the principle of operation of a tandem solar cell.
4. What is meant by maximum power point tracking (MPPT) in solar PV system?
5. Classify different types of wind turbines.
6. List the advantages and disadvantages of wind energy conversion system.
7. Discuss the issues in connecting renewable energy systems to the grid.
8. What are the uses of electronic conversion systems?
9. Discuss the importance of smart metering protocols in grid connectivity.
10. What are the key features of smart grid?

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Explain with a neat sketch, the working of solar and wind power plant. 10
    b) Discuss the applications of solar and wind energy. 4

OR

12. Discuss various types of renewable energy resources. 14

MODULE II

13. a) Explain various topologies of solar PV inverter.What is the need of isolation transformer? 8
    b) Illustrate the working of grid connected solar PV system. 6

OR

14. a) Explain the photovoltaic effect. Describe the electrical characteristics of a solar cell. 8
    b) Explain any one thin film deposition method. 6

MODULE III

15. a) Explain the lift and drag forces in wind and its importance in wind power generation. 6
    b) Illustrate fixed speed induction generator with capacitor bank. 8

OR

16. a) Illustrate vertical axis wind turbine (VAWT) and horizontal axis wind turbine (HAWT). 10
    b) Briefly explain wind amplified rotor platform (WARP) technology. 4

MODULE IV

17. Explain the network voltage, power quality and frequency management in power systems. 14

OR

18. Explain the factors influences the PV/WECS on system transient response. 14

MODULE V

19. a) What are the functions of distribution management system? 7
    b) With a neat block diagram, explain the working of smart meter. 7

OR

20. a) Explain the structure and functions of a SCADA system. 8
    b) Compare smart meter and conventional meter. 6

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