Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20441

B.E/B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Eighth Semester

Electrical and Electronics Engineering

EE 6009 — POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS

(Regulations 2013)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the principle of operation of wind turbine.

2. Mention some types of fuel used in biomass plant.

3. Draw the speed-torque curve of induction generator.

4. Explain briefly, the rotor construction of DFIG.

5. Draw the I-V and P-V characteristics of solar cell.

6. Mention the factors considered in the selection of inverter and battery sizing.

7. Mention some of the issues in stand-alone solar system.

8. Classify the types of WECS based on the rotational speed of turbines.

9. What are the types of hybrid system?

10. Define smart power tracker.

PART B — (5 × 16 = 80 marks)

11. (a) Explain with a neat diagram, the different types of concentrating type solar collector with its operation and working principles. (16)

Or

(b) Explain the following with neat schematics : (16)

(i) Biomass energy system

(ii) Energy from ocean.

12. (a) Illustrate the working and principle of grid connected PMSG in wind power plant. (16)

Or

(b) Discuss the working principle of SCIG connected to a grid network and state its advantage for operating with wind turbine. (16)

13. (a) Explain the operation and control of matrix converter with its circuit diagram and switching condition. (16)

Or

(b) Explain the operation of following converters : (16)

(i) Three phase AC voltage controller

(ii) PWM inverter.

14. (a) Write a brief note on stand-alone operation of fixed and fully variable speed WECS. (16)

Or

(b) Explain the operation of solar model in grid integrated system with and without battery backup. (16)

15. (a) Discuss different hybrid systems configurations consisting of wind turbine and solar power plant. (16)

Or

(b) Explain the factors to be considered for placing the wind-PV system. Discuss its plant details, operating period and environmental aspects for assumed residential load. (16)

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