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

Question Paper Code: S31382

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Elective

Electrical and Electronics Engineering

01UEE921 - POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. List out the salient features of renewable energy sources.
2. Mention some organic materials used in bio mass plant.
3. What are the merits of Squirrel Cage Induction Generators for Wind Energy Conversion System?
4. What is the need of active crowbar in DFIG?
5. What are the guiding factors for selection of inverter?
6. What are matrix converters?
7. Give the difference between fixed and variable speed wind energy conversion system.
8. Define solar insolation.
9. List out the various types of hybrid renewable energy systems.
10. How is electrical maximum power tracking different from a mechanical sun - tracking of a PV module?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Discuss the impact of renewable energy generation on environment. (8)

(ii) Explain the control strategy used for single stage grid connected PV system. (8)

Or

(b) Explain the operating principle of any four types of renewable energy sources. (16)

12. (a) Draw the schematic diagram of PMSG and explain the constructional features principle of operation in detail and also discuss the characteristics and issues briefly. (16)

Or

(b) Explain the constructional features principle of operation of SCIG with a neat diagram and analyze the merits and demerits of SCIG. (16)

13. (a) (i) Draw and explain block diagram of solar photo voltaic system. (8)

(ii) Draw the schematic of buck - boost converter and explain the operational detail. (8)

Or

(b) Explain the following in detail in energy conversion system

(i) AC Voltage controllers. (8)

(ii) Voltage control in PWM Inverters. (8)

14. (a) With neat sketches explain the fixed speed wind energy conversion system with relevant sketches. (16)

Or

(b) (i) Explain the operation of grid integrated PMSG system with neat block diagram. (8)

(ii) Write short notes on grid integrated solar system. (8)

15. (a) Explain in detail about the need and advantages of hybrid renewable energy systems. Also illustrate the operation of Wind – PV hybrid system with neat diagram in detail. (16)

Or

(b) Explain the incremental-conductance based MPPT algorithm with a suitable illustration. (16)