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**Question Paper Code: 39321**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

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. What are the environmental aspects of electric energy conversion?
2. Give the methods of ocean thermal electric power generation.
3. What is reference frame transformation?
4. What are the advantages of DFIG?
5. What are the guiding factors for selection of inverter?
6. What are matrix converters?
7. What are the draw backs of stand-alone solar system?
8. Define solar insolation.
9. List out the various types of hybrid renewable energy systems.
10. List the factors influencing the control algorithm for MPPT.

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) (i) Explain the design and principle of operation of fuel cell in detail. (10)
- (ii) List out the classification of fuel cell. (6)
12. (a) (i) Explain the theory of operation of a doubly fed induction generator. (8)
- (ii) Explain the theory of operation of SCIG. (8)
- Or
- (b) Explain the theory of operation of a doubly fed induction generator. (16)
13. (a) (i) Explain the principle of operation of Line commutated inverter. (8)
- (ii) Explain the principle of operation of three phase ac voltage controller. (8)
- Or
- (b) Describe using a diagram the working of a matrix converter as an inverter. (16)
14. (a) With neat sketches explain the fixed speed wind energy conversion system with relevant sketches. (16)
- Or
- (b) Explain the operation of grid integrated PMSG system with neat block diagram. (16)
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) Draw the block diagram of the Hybrid Renewable energy system which integrates Wind energy system and Solar PV system and explain the operation in detail. Also explain the issues and challenges in the operation of Hybrid systems. (16)