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B.E / B.Tech/ (Arrear) END SEMESTER EXAMINATIONS, APRIL / MAY 2019

ELECTRICAL AND ELECTRONICS ENGINEERING

EE 8018 Power Electronics for Renewable Energy Systems

(Regulation 2012)

Time: 3 Hours

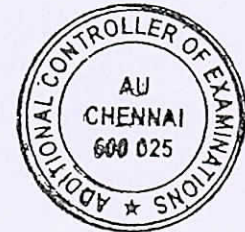
Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What are the causes of global warming problem?
2. Name the different types of fuel cells.
3. Mention the commonly used reference frames used in d-q transformation for modeling electrical machines?
4. What is the effect of injected emf in the rotor of an induction machine?
5. Define Fill factor of a solar cell.
6. Mention the factors affecting the life of the battery.
7. Classify generators based on excitation.
8. State the drawbacks of single output fixed speed system.
9. Write the disadvantages of wind-Diesel hybrid energy system.
10. What is the algorithm used in incremental conductance method of maximum power tracking?

Part – B (5 x 16 = 80 marks)



11. Explain with respect to wind energy
 - i. Wind Control Systems (8)
 - ii. (Power and torque) vs speed characteristics of wind turbine. (8)
12. a) Derive the dynamic d-q axis model of induction generator.

(OR)

b) Consider a surface PM pole rotor PMSG with $R_s=1\Omega$, $L_s=L_d=L_q=0.05H$, $\Psi_{PM1}=0.5$ Wb and $p_1=2$ pole pairs that have to deliver power into a three-phase resistance of $R_L=10 \Omega$ / phase at the speed $n_1=3000$ rpm. Calculate the phase voltage, current and power delivered to the load resistance.
13. a) Explain in detail, the operation of current controllers used with grid interactive inverters.

(OR)

b) Discuss any two type of DC-DC converter for interfacing PV module to dc load system.

14. a) With relevant expressions, discuss the bidirectional flow of power achieved in DFIG using an ac/dc/ac converter.

(OR)

b) Explain the building up of voltage in a self- excited induction generator and derive the stator-referred circuit model of a self- excited induction generator normalized to the base frequency.

15. a) Discuss in detail the relative merits and demerits of hybrid system in case of wind-PV System.

(OR)

b) Explain in detail with flowchart, any three control algorithms for Maximum power point tracking.

