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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER M.TECH DEGREE EXAMINATION, MAY 2016

Electrical and Electronics Engineering

(Power Control and Drives)

01EE6518 Power Electronics for Renewable Energy Systems

Max. Marks: 60 Duration: 3 Hours

*Answer **any two Full questions** from each part*

Part A

1. a. Explain the Environmental aspects of electric energy conversion (4)

   b. Explain the impacts of renewable energy generation on environment (5)

2. Explain in detail with neat sketches the principle of operation of the following energy options as applied for stand alone systems.

   a. Biomass (4)

   b. Hydrogen energy systems (5)

3. Explain with neat circuit diagram and waveforms explain the principle of operation of SCIG (9)

Part B

4. Explain in detail with neat circuit diagrams the following power converters used in grid integration of renewable energy sources

   a. Uncontrolled rectifier (4)

   b. Matrix converter (5)

5. a. Explain the various type of power converters used in solar photo voltaic system (5)

   b. Draw and explain MPPT of a solar cell (4)

6. a. With neat block diagram explain the working of solar photo voltaic system (5)

   b. Explain the terms related to wind power analysis (4)

   i) Coefficient of Performance, C_P

   ii) Tip speed ratio, λ

   Also draw the analysis graphs relating the above parameters

Part C

7. Describe the various MPPT techniques employed in solar-PV and wind energy conversion systems. Also explain in detail any one algorithm for each option. (12)

8. a. Explain the need of hybrid energy systems (6)

   b. Explain the stand alone operation of solar system (6)

9. Explain in detail the grid interactive PMSG based WECS. Also mention the grid interconnection issues of solar and wind power. (12)
