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Question Paper Code: 52593

M.E. DEGREE EXAMINATION, NOV 2016

Elective

Power Electronics and Drives

15PPE510 - SOLAR AND ENERGY STORAGE SYSTEM

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Which Air Mass has become the standard for photovoltaic work
(a) AM1 (b) AM1.5 (c) AM2 (d) AM0
2. Adding cells in series to a photovoltaic module will
(a) Decrease the voltage (b) Increase the voltage
(c) Decrease the current (d) Increase the current
3. The National Renewable Energy Laboratory is located in
(a) Germany (b) Japan (c) Australia (d) America
4. Which type of battery used in cell phones?
(a) Lead-acid battery (b) Nickel –cadmium battery
(c) Lithium-ion battery (d) Nickel-metal-hydride battery
5. Which country was the first use of solar cell in telecommunication application?
(a) Japan (b) India (c) America (d) Australia

PART - B (5 x 3 = 15 Marks)

6. What is fill factor?
7. Define depth of discharge in a battery.

8. List out the mounting photovoltaic arrays on rooftop.
9. What is solar thermal energy storage system?
10. How the solar cells are applied in telecommunication systems?

PART - C (5 x 16 = 80 Marks)

11. (a) Explain how 'hot spots' can occur in a partially shaded cell connected to a large photovoltaic array. (16)

Or

- (b) Briefly discuss features of a silicon solar cell that affect its spectral response. (16)

12. (a) Together with solar PV panel, battery and inverter are most common parts of a PV system. Why? (16)

Or

- (b) Explain the concept of self-regulation as applied to battery charging with solar cells. (16)

13. (a) What are the design issues for central power station? Explain in detail. (16)

Or

- (b) Discuss in detail about international PV programs. (16)

14. (a) Explain any one of the secondary battery technology. (16)

Or

- (b) Discuss with neat sketch on pumped hydroelectric energy storage system. (16)

15. (a) Give an overview of solar cell applications, past, present and future. (16)

Or

- (b) Give specific details as to why solar cells are well suited to telecommunication application. (16)