

Roll No.

Total Pages : 3

425103

December, 2019

M.Tech. (PS) - I SEMESTER

RENEWABLE ENERGY SYSTEM (MPS103A)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) Define point of common coupling. (1.5)
- (b) Write *two* points on Nuclear Power Energy. (1.5)
- (c) Define the principle of primary power frequency control for conventional generators. (1.5)
- (d) Explain the theory of momentum with respect to wind power. (1.5)
- (e) Define the fill factor of the solar cell. (1.5)

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- (f) A synchronous system has a total control strength of 25,500 MW/Hz. A shortage of 1350 MW in production occurs in a control area with a control strength of 2500 MW/Hz. Calculate the drop in frequency? (1.5)
- (g) How does an Internal Combustion Engine work. (1.5)
- (h) Explain restoration after blackout in power. (1.5)
- (i) Differentiate a solar cell from conventional p-n junction diode. (1.5)
- (j) Explain hosting capacity approach in power system. (1.5)

PART - B

- 2. (a) Explain Distributed and Centralized generation interconnection with its benefits and challenges. (7)
- (b) Discuss the principle of solar photovoltaic energy conversion with I-V characteristics of solar cell. (8)
- 3. (a) A solar cell array is required to deliver 100 W peak output at 120 V DC bus voltage. The solar cell to be used are rated 0.1 W peak output at 0.4 V. Assuming that there are no assembly losses, find the array. (7)
- (b) Explain (N-1) Criterion in Distributed generation. (8)

4. (a) Discuss the impact of Distributed generation on the power system. (7)
- (b) Explain the secondary control and reserves in transmission system operation. (8)
5. (a) Explain the effect of power quality in Distributed generation. (7)
- (b) Discuss Full power electronics coupling with the grid. (8)
6. (a) Discuss the protection failures which occur due to distributed generation. (7)
- (b) Write a note on Economics of distributed generation. (8)
7. (a) Calculate the fault current through CB for upstream 3 phase faults when generation is connected along the feeder. (8)
- (b) Explain Micro turbines for Distributed power generation. (7)
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