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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

Course Code: EE403

Course Name: DISTRIBUTED GENERATION AND SMART GRIDS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks. Marks

1 What is an active distribution network? Explain its relevancy in microgrid system. (5)

2 Explain the operation of a lead acid battery and mention its merits and demerits. (5)

3 Draw the block diagram of an Automated Meter Reading(AMR) system and write the functions of each block. (5)

4 Define Energy management. What is the significance of energy management? (5)

5 Explain briefly the benefits AMI? (5)

6 What are the different advantages of smart substations over conventional substations? (5)

7 What are the various types of clouds? (5)

8 List the various power quality disturbances in the grid. (5)

PART B

Answer any two full questions, each carries 10 marks.

9 Draw and explain the typical configuration of a DC microgrid. (10)

10 a) Explain the role of central controller in stand-alone and grid connected mode of operation of microgrids. (5)

b) Explain the control functions of micro-resource controller (MC). (5)

11 Explain the working and operation of different Wind Energy Conversion Systems. Also mention the advantages and disadvantages. (10)

PART C

Answer any two full questions, each carries 10 marks.

12 a) Draw the block diagram and explain the working of Phasor Measurement Unit(PMU). 5

b) What is a smart sensor? Using block diagram, explain the different components 5

of a smart sensor.

13 Explain different scenarios related to the islanding of microgrid? 10

14 a) A power station has a maximum demand of 35MW, a plant capacity factor of 50%, a plant use factor of 70% and load factor of 60%. Determine (i) Reserve capacity (ii) Daily energy produced (iii) Maximum energy that can be produced daily if the plant runs as per the schedule. 7

b) Justify the statement 'Greater the diversity factor, the lesser is the cost of generation of power'. 3

PART D

Answer any two full questions, each carries 10 marks.

15 a) Explain the application of SANET in Smart Grid 5

b) List the SANET actors and explain the requirements of these for different Smart Grid applications. 5

16 List and explain the various harmonic sources in grid. 10

17 a) Explain cloud computing infrastructure. 5

b) Explain with neat sketch cloud computing architecture 5

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