

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

**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	Compare smart grid with conventional utility grid.	(5)
2	Explain how the real and reactive powers are controlled in a power electronic inverter based energy source.	(5)
3	What is a smart meter, used in smart grid? List the features.	(5)
4	List any five key features of smart energy efficient end use devices.	(5)
5	Write short note on the design considerations of Sensor and Actuator Networks (SANET).	(5)
6	Describe the characteristics of AMI?	(5)
7	Write short notes on Distortion Index (DIN).	(5)
8	How Cloud computing is useful in a smart grid?	(5)

**PART B**

*Answer any two full questions, each carries 10 marks.*

9	Draw and explain the typical configuration of an AC microgrid.	(10)
10	With the help of block diagrams, explain the classification and working of micro turbines.	(10)
11	a) Explain the components of an Ultra capacitor. Mention its advantages and disadvantages.	(5)
	b) Explain the working flywheel energy storage (FES) system.	5

**PART C**

*Answer any two full questions, each carries 10 marks.*

12	Draw and explain the National Institute of Standards and Technology (NIST) Smart grid reference architecture. Explain its various domains.	10
13	a) What do you mean by islanding of microgrid? List the different islanding scenarios in microgrid.	5

- b) What is load shaping? What are the advantages? 5
- 14 A power station has the following daily load cycle 10

Time(Hr)	0-5	5-11	11-13	13-16	16-22	22-24
Load(MW)	15	25	40	30	35	25

Draw the load curve and determine (i) Maximum demand (ii) Total energy units generated per day (iii) Average load (iv) Load factor

#### PART D

*Answer any two full questions, each carries 10 marks.*

- 15 What is Feeder Automation? List and explain the different components of Feeder Automation. 10
- 16 a) Explain with neat sketches the basic architecture of smart substation. 7
- b) Enumerate various advantages of smart substation 3
- 17 List and explain various power quality issues with smart grids. 10

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