Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

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		Discuss the opportunities, challenges and benefits of smart grids.	(5)
2		Draw the conceptual diagram of Combined Heat Power system and list any two advantages and disadvantages.	(5)
3		Elaborate the impact of increased penetration of distributed generation in distribution system.	(5)
4		Illustrate role of technology in demand response in DSM.	(5)
5		Discuss the role of Sensor and Actuator Networks (SANETs) in smart grid implementation.	(5)
6		Discuss the features of Advanced Metering Infrastructure.	(5)
7		Draw and explain the architecture of cloud computing.	(5)
8		Explain how transients affect the power quality.	(5)

PART B

Answer any two full questions, each carries 10 marks.

9		With neat sketches, explain the various interconnection configurations of DC microgrid in detail.	(10)
10		List the various Distributed Energy Resources and explain the operation of any two types with relevant diagrams.	(10)
11	a)	Explain the technical and economical advantages of Microgrid.	(5)
	b)	Explain the function of Central Controller (CC) in microgrid.	(5)

PART C

Answer any two full questions, each carries 10 marks.

12	(a)	List the advantages and disadvantages of integration of Plug-In hybrid EV into the utility grid.	(5)
	(b)	Discuss the Intelligent Electronic Devices and their application for monitoring and protection.	(5)

13	(a)	With a neat block diagram, elaborate working of smart sensors. Discuss the various deployment schemes with typical examples for each.	(5)
	(b)	How demand side management can be implemented in smart grid?	(5)
14	a)	With a neat block diagram explain the features of smart meter. Elaborate the features that can play an important role in smart grid implementation.	(5)
	b)	A power station supplies the following loads to various consumers Industrial Consumer =1500kW, Commercial establishment = 750kW, Domestic power =100kW and Domestic Lighting = 450kW. If the maximum demand on the station is 2500kW and the units of kWh generated per year is 45x105, determine (i) the diversity factor, (ii) average load and (iii) annual load factor.	(5)

PART D

Answer any two full questions, each carries 10 marks.

15		With neat diagram, discuss in detail the various components of a smart substation.	(10)
16		Classify cloud computing based on its deployment and service. Propose suitable cloud architecture for smart grid.	(10)
17	(a)	Describe the challenges and benefits of Home Area Network (HAN).	(5)
	(b)	Discuss the short duration and long duration power quality events with neat illustrations.	(5)

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