

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

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| 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.*

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| 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.*

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| 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 (5)
- 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 45×10^5 , determine (i) the diversity factor, (ii) average load and (iii) annual load factor.

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)
