

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (R,S) Exam April 2025 (2019 Scheme)

Course Code: EET434**Course Name: SMART GRID TECHNOLOGIES****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

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| 1 | Define Smart grid and its necessity. | (3) |
| 2 | Explain the factors that lead to reduced environmental impacts due to smart grid implementation. | (3) |
| 3 | Write a note on Bluetooth Low Energy. | (3) |
| 4 | Summarize the Home Area Network (HAN) used in the smart grid. | (3) |
| 5 | Explain real-time pricing. | (3) |
| 6 | List various components of the Advanced Metering Interface (AMI). | (3) |
| 7 | Write a note on the Outage Management System. | (3) |
| 8 | Explain the components of the Geographic Information System. | (3) |
| 9 | What is the difference between the private, public, and hybrid cloud? Give examples. | (3) |
| 10 | Explain how power quality can be monitored and controlled in a smart grid. | (3) |

PART B*Answer any one full question from each module, each carries 14 marks.***Module I**

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| 11 | a) Differentiate between conventional grid and smart grid. | (8) |
| | b) Elaborate on how the self-healing concept can be implemented to improve the reliability of the smart grid. | (6) |

OR

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| 12 | a) Elaborate on the major challenges in deploying a smart grid in the Indian scenario. Give suggestions to overcome these challenges. | (8) |
| | b) Discuss the components of the smart grid. | (6) |

Module II

- 13 a) Draw the communication network architecture for the smart grid. Discuss the functioning of each component (10)
b) Differentiate between 3G and 4G (4)

OR

- 14 a) Explain the significance of IEC 61850 standards and its benefits in the smart grid. (8)
b) Compare broadband over power line. (6)

Module III

- 15 a) Describe the integration of smart appliances for home and building automation. (8)
b) Discuss the block diagram of vehicle-to-grid technology. (6)

OR

- 16 a) With a neat block diagram explain the wide Area Monitoring System (WAMS) and its role in improving the stability of the grid. (10)
b) Explain the features of Advanced Metering Infrastructure (AMI). (4)

Module IV

- 17 a) Summarize the components of Smart Substation. (10)
b) Describe energy management with the help of an example. (4)

OR

- 18 a) Explain the role of feeder automation in improving the reliability of the smart grid. List the enabling components and elaborate on their role in feeder automation. (10)
b) Write a note on the smart inverters. (4)

Module V

- 19 a) Explain any five cyber security and their solutions in the smart grid. (10)
b) Explain the necessity of cyber security in the smart grid. (4)

OR

- 20 a) Describe the power quality issues of the smart grid. (8)
b) List out the different functionalities of cloud computing in a smart grid. (6)
