

Exam.Code:1017
Sub. Code: 35254

2125
M.E. Electrical Engineering (Power System)
First Semester
EE(PS)-8104: Smart Grid Technologies

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt any five questions.

x-x-x

- I. Explain the intelligent architecture of Smart Grid with a neat block diagram. (10)
- II. Explain the concept of Smart Metering and its role in Automation Technologies in modern power systems. (10)
- III. Explain in detail the various Smart Grid Communication Technologies used for efficient monitoring, control and automation of modern power systems. Also highlight the factors to be considered while selecting an appropriate communication technology for Smart Grid applications. (10)
- IV. Explain the concept of a Smart Substation in modern power systems. Discuss its key components, communication architecture, and the role of IEC-61850 in ensuring interoperability. (10)
- V. Explain the architecture and functioning of a Wide Area Management System (WAMS) in modern power grids. Discuss the role of Phasor Measurement Units (PMUs), in achieving real-time monitoring, control, and grid stability. (10)
- VI. Explain the role of Smart Energy Storage Systems in Smart Grid. Discuss their architecture, different types of storage technologies, and how intelligent control strategies enhance grid reliability, renewable integration, and peak load management. (10)
- VII. Explain the concept of a Microgrid. Discuss the need for microgrids in modern power systems and elaborate on various applications of microgrids in real-world scenarios.(10)
- VIII. Explain the concept of islanding in a microgrid. Discuss in detail the need for islanding and highlight the major technical, operational, and economic benefits it offers in modern power systems. (10)

x-x-x