Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination Dec-2023

EE3EW06 / EX3EW06 Introduction to Smart Grid

Programme: B.Tech. Branch/Specialisation: EE/EX

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Advantages of smart grid are- **1**

(a) Self-healing grid
(b) Motivates and includes the consumer
(c) Remote load control
(d) All of these

ii. Cyber security consists of- **1**

(a) Information security (b) Network security
(c) Operational security (d) All of these

iii. SCADA system components are- **1**

(a) Master station (b) Communication system
(c) RTU (d) All of these

iv. AMI objectives are- **1**

(a) Network problem identification
(b) Load profiling
(c) Energy audit and partial load curtailment in place of load shedding
(d) All of these

v. A grid interactive solar system- **1**

(a) Always supplies power to grid
(b) Supplies power to grid as well as receives power from the grid as required
(c) Always receives power from the grid
(d) Work only when the grid fails

P.T.O.

vi. Smart inverters are used to interface- **1**
(a) RE sources with the electricity grid
(b) Conventional sources with the electricity grid
(c) DG with the electricity grid
(d) RE sources with the battery bank

vii. Micro-grid feeder area capacity has- **1**
(a) 5 to 10 megawatt (b) 10 to 20 megawatt
(c) 20 to 30 megawatt (d) 35 to 40 megawatt

viii. Micro-grids are classified based on- **1**
(a) Operation, structure, types of source
(b) Types of source, scenario and size
(c) Operation, scenario and size
(d) All of these

ix. OMS means- **1**
(a) Overall Maintenance System
(b) Overall Management System
(c) Outage Management System
(d) Outage Maintenance System

x. Which of the smart sensors used in smart grids? **1**
(a) Current sensors (b) Voltage sensors
(c) Temperature sensors (d) All of these

Q.2	i.	Write the applications of smart grid.	**3**
	ii.	Explain the components and architecture of smart grid design.	**7**
OR	iii.	Explain the necessity of cyber security for smart grid.	**7**
Q.3	i.	Explain how the automatic meter reading can make the system smarter.	**2**
	ii.	Explain phasor measurement unit (PMU) in details.	**8**
OR	iii.	What is Advanced Metering Infrastructure (AMI)? Discuss its significance in smart grid technology.	**8**
Q.4	i.	List the various renewable energy grid integration issues.	**2**
	ii.	Explain solar energy in the context of smart grid.	**8**
OR	iii.	Explain the concept of EV. How EVs can support smart grid.	**8**

Q.5	i.	Explain the concept of micro grid.	**3**
	ii.	Describe the various components of micro-grid.	**7**
OR	iii.	What are the operational issues with micro-grid? Explain them.	**7**
Q.6	i.	Explain in brief about smart sensors.	**4**
	ii.	Explain the concept of Outage Management Systems (OMS).	**6**
OR	iii.	Explain the role of smart grid in loss management.	**6**

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