

Enrolment No.....



Faculty of Engineering
End Sem (Odd) Examination Dec-2022
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.

- 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. Smart grid enables- **1**
 (a) Distributed energy management
 (b) Centralized energy management
 (c) Both distributed and centralized energy management
 (d) None of these
- iii. In smart grids, PMU stands for- **1**
 (a) Phase measurement unit (b) Phasor measurement unit
 (c) Phase monitoring unit (d) All of these
- iv. In smart grids, AMI means- **1**
 (a) Automated metering instrument
 (b) Alternate metering instrument
 (c) Advanced metering infrastructure
 (d) Advanced metering instrument
- v. Which method of energy storage used in conjunction with a wind form? **1**
 (a) Advanced rail energy (b) Flywheel energy
 (c) Compressed air energy (d) All of these
- vi. Which of the following is the grid integration issues? **1**
 (a) Power quality issues (b) Storage
 (c) Islanding (d) All of these

P.T.O.

- vii. A localized grouping of electricity generations, energy storage, and loads is termed as- **1**
 (a) Macro grid (b) Traditional grid
 (c) Micro grid (d) Virtual power plant
- viii. In a typical AC microgrid which of the following helps to regulate voltage and frequency in the islanded mode of operation? **1**
 (a) Diesel generator (b) Connected inverter
 (c) Grid (d) PMSG wind
- 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. List the applications of WAMS. **2**
 ii. Explain the concept of supervisory control and data acquisition (SCADA). **8**
 OR iii. Discuss about phasor measurement units (PMU). **8**
- Q.4 i. List the various renewable energy grid integration issues. **2**
 ii. Explain the concept plug in hybrid electric vehicles. **8**
 OR iii. Explain solar energy in the context of smart grid. **8**
- Q.5 i. Give complete classification of micro grid. **3**
 ii. Describe the concept and formation of micro grid. **7**
 OR iii. Discuss different issues of micro grid when interconnected. **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**

Marking Scheme
EE-EX3EW06 Introduction to Smart Grid

Q.1	i)	(d) All of the above		1
	ii)	(a) Distributed energy management		1
	iii)	(b) Phasor measurement unit		1
	iv)	(c) Advanced Metering Infrastructure		1
	v)	(c) compressed air energy		1
	vi)	(d) All of the above		1
	vii)	(c) Micro Grid		1
	viii)	(b) Connected invertor		1
	ix)	(c) Outage Management System		1
	x)	(d) All of the above		1
Q.2	i.	Applications of smart grid	- 3 marks	3
	ii.	Components	- 4 marks	7
		Architecture	- 3 marks	
OR	iii.	Cyber security	- 5 marks	7
		Block diagram	- 4 marks	
Q.3	i.	Various applications of WAMS	- 2 marks	2
	ii.	diagram of SCADA	- 2 marks	8
		explanation of concept	- 6 marks	
OR	iii.	diagram of PMU	- 2 marks	8
		explanation of PMU concept	- 6 marks	
Q.4	i.	List of the grid integration issues	- 2 marks	2
	ii.	Diagram of PHEV	- 2 marks	8
		Concept of PHEV	- 6 marks	
OR	iii.	Explanation of Solar energy in context of SG	- 6 marks	8
		Diagram	- 2 marks	
Q.5	i.	Classification of micro grid	- 3 marks	3
	ii.	concept of micro grid	- 3 marks	7
		formation of micro grid	- 4 marks	
OR	iii.	Different issues	- 3 marks	7
		their explanation	- 4 marks	

Q.6	i.	List of smart sensors	- 2 marks	4
		their brief explanation	- 2 marks	
	ii.	Concept of OMS	- 2 marks	6
		With diagram	- 4 marks	
	iii.	Explain role of SG in loss management	- 6 marks	6
