KUMARAGURU
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B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Seventh Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EEE0007: Smart Grid Engineering

COURSE OUTCOMES

CO1: Understand the fundamental elements of the smart grid.

CO2: Understand the importance of information and communication technologies of the smart grid.

CO3: Understand various sensing and measurement technologies involved with the smart grid.

CO4: Illustrate the concepts of control and automation techniques in smart grid.

CO5: Understand the role of power electronics in smart grid and to classify the different energy storage techniques.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Differentiate Smart Grid with existing grid.	CO1	[K2]
2.	Illustrate the conceptual block diagram of Smart Grid.	CO1	[K2]
3.	Infer the importance of data communication in power system.	CO2	[K2]
4.	Outline the functions of data link layer.	CO2	[K2]
5.	State the significance of Phasor Measurement Unit.	CO3	[K2]
6.	Define demand side management.	CO3	[K2]
7.	Differentiate relay IED and recording IED.	CO4	[K2]
8.	Mention the functions of Bay controller.	CO4	[K2]
9.	State the importance of power electronic converters in Smart Grid.	CO5	[K2]
10.	Infer why HVDC is preferred in transmission systems?	CO5	[K2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.		Explain the architecture of Smart Grid and the functions of each component.	16	CO1	[K2]
12.	a)	Classify and explain the communication technologies for Smart Grids.	14	CO2	[K2]
	b)	Define packet switching technique in data communication.	2	CO2	[K2]

13.	Describe the process of Wide Area Monitoring System with its components.	16	CO3	[K2]
14. a)	Elaborate SCADA modelling and analysis with its architecture.	12	CO4	[K2]
b)	Explain the operation of potential transformer.	4	CO4	[K2]
15.	Discuss the role of FACTS in Smart Grid by Shunt and series compensation techniques.	16	CO5	[K2]
16. a)	Construct the SOC equation in battery modelling.	2	CO5	[K3]
b)	Briefly explain the different types of energy storage technologies.	14	CO5	[K2]

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