Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U3107

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Professional Elective

Electrical and Electronics Engineering

21EEV107 - SMART GRID

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1.	State the challenges faced in the deployment of smart grids.	CO1-U
2.	List two differences between conventional grids and smart grids.	CO1-U
3.	State the AMI protocols.	CO1-U
4.	How does AMI contribute to the smart grid?	CO1-U
5.	How does smart substation technology contribute to grid efficiency?	CO1-U
6.	Explain the concept of wide area monitoring.	CO1-U
7.	Mention one benefit of using high-efficiency distribution transformers.	CO1-U
8.	Name one type of high-efficiency distribution transformer.	CO1-U
9.	Explain the concept of Wide Area Network (WAN).	CO1-U
10.	How does big data contribute to smart grid operations?	CO1-U

PART – B (5 x 16= 80 Marks)

11.	(a)	Elaborate on the national and international initiatives in smart grid technology, detailing at least two initiatives from each.	CO2- App	(16)
		Or		
	(b)	Identify and analyze the challenges and benefits of smart grid implementation in detail, including economic, technical, and environmental aspects.	CO2- App	(16)

12.	(a)	Explain the benefits and challenges of implementing AMI in modern power systems.	CO1- U	(16)
		Or		
	(b)	Describe the functionality and importance of Phasor Measurement Units (PMUs) in smart grids	CO1- U	(16)
13.	(a)	Discuss the technological drivers and advancements in smart grid transmission systems	CO1- U	(16)
		Or		
	(b)	Describe the importance of EMS and wide area monitoring in the effective management of smart grids.	CO1- U	(16)
14.	(a)	Analyze the role of Volt/VAr control in maintaining voltage stability and efficiency in smart grids.	CO4- An	(16)
		Or		
	(b)	Evaluate the impact of outage management systems on the reliability and resilience of power distribution networks.	CO4- An	(16)
15.	(a)	Analyze the benefits and challenges of using Broadband over Power Line (BPL) for smart grid communication.	CO4- An	(16)
		Or		
	(b)	Analyze the importance of cyber security in smart grids and the measures taken to protect these systems from cyber threats	CO4- An	(16)