Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Seventh Semester - Regular) Examinations, November – 2025

22BELPE47011/22BEEPE47011 – Smart Grid

(EE / EEE)

Time: 3 hrs Maximum: 70 Marks

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	Define Smart grid as per European Technology Platform	CO1	K1
b.	Describe about feeder automation	CO2	K3
c.	Explain the advantages of WAMS.	CO3	K3
d.	Define distributed generation and enumerate the benefits it offers in terms of grid resilience and energy security.	CO4	K2
e.	How do energy storage systems help address the intermittency of renewable energy sources and ensure a stable power supply?	CO5	K2

PART – B **(15 x 4 = 60 Marks)**

		Marks	CO #	Blooms Level
	Answer ***all*** the questions			
2. a.	Explain the architecture of smart grid with neat diagram	8	CO1	K3
b.	What is IED and how it will monitor smart grid operation	7	CO2	K2
	(OR)			
c.	Write short notes on the following: a) Real time pricing b) Automatic meter reading	8	CO1	K3
d.	Distinguish between conventional grid and smart grid	7	CO2	K3
3.a.	What is the role of Wide-Area based Protection and Control in Smart grids?	8	CO3	K2
b.	What is the need of micro grid and its applications?	7	CO3	K2
	(OR)			
c.	Explain the operation of WAMS with its benefits	8	CO3	K3
d.	Explain the concept of micro grids and its operation	7	CO3	K3
4.a.	Outline the step-by-step process of conducting a comprehensive power quality audit, from initial data collection to the generation of actionable recommendations.	8	CO4	K3
b.	Explain the concept of demand-side management in micro-grids and how it can be leveraged to balance supply and demand.	7	CO6	K3
	(OR)			
c.	Explore the emerging technologies and methods for improving power quality in smart grids, including the use of power electronics and energy storage systems. What are the benefits and challenges associated with these technologies?	8	CO4	K3
d.	Explore the emerging technologies and methods for improving power quality in smart grids, including the use of power electronics and energy storage systems. What are the benefits and challenges associated with these technologies?	7	CO6	K3
5.a.	Provide a detailed explanation of the electrochemical processes that occur within a fuel cell, highlighting the conversion of fuel into electricity and the associated efficiencies.	8	CO5	K3
b.	Short Notes on Pumped Hydro and Compressed Air Energy Storage	7	CO5	K3
	(OR)			
c.	Explain the operational principles of variable speed wind generators, including the role of power electronics and variable rotor speeds. How do these features enhance energy capture and efficiency?	8	CO5	K3
d.	Short Notes on BESS and SMES.	7	CO5	K3