Unit-III

Part – A (Short Answer Questions)

S.No	Questions	BT	CO	PO
	Part – A (Short Answer Questions)			
1	What are the main utility applications of Energy Storage Systems?	L1	C03	PO1
2	Define time shifting in energy storage systems.	L1	C03	PO1
3	What is the purpose of Pumped Hydro Storage (PHS) in electric utilities?	L2	C03	PO2
4	Mention any two applications of Compressed Air Energy Storage (CAES).	L2	C03	PO2
5	What is meant by investment deferral using EES?	L1	C03	PO1
6	How do Energy Storage Systems support renewable energy integration?	L1	C03	PO1
7	Define Smart Grid and state its objective.	L1	C03	PO1
8	What is a Smart Micro grid?	L1	C03	PO1
9	List any four advantages of Energy Storage Systems in Smart Houses.	L1	C03	PO1
10	Name the battery technologies commonly used in Hybrid Electric Vehicles (HEVs) and Electric Vehicles (EVs).	L1	C03	PO1

Part – B (Long Answer Questions)

11	a)	Explain the present status of Energy Storage System (EES) applications. Discuss utility and consumer uses of EES.	L1	C03	P02
	b)	Describe the role of Pumped Hydro Storage (PHS) in utility applications for time shifting, peak load management, and power quality improvement.	L1	C03	PO2
12	a)	Explain the working and applications of Compressed Air Energy Storage (CAES) in electric utilities. Compare the Huntorf and McIntosh CAES plants.	L2	C03	PO1
	b)	Discuss the use of Lithium-Ion battery energy storage systems in power networks. Explain how they help in frequency regulation and investment deferral.	L1	C03	P02
13	a)	Explain the role of Energy Storage Systems in isolated/off-grid power systems with suitable examples.	L2	C03	PO1
	b)	Discuss the importance of Energy Storage Systems in Renewable Energy Generation. Explain decentralized PV storage systems and wind power smoothing applications.	L2	C03	P05
14	a)	What is a Smart Grid? Explain the role of Energy Storage Systems in Smart Grid operation, demand-side management, and frequency control.	L2	C03	PO1
	b)	Explain the concept of a Smart Microgrid. Discuss its architecture, characteristics, and the role of EES in improving reliability and scalability.	L3	C03	P03

15	a)	Describe the Smart House concept. Explain how Energy Storage Systems help in load leveling, renewable energy utilization, and uninterrupted power supply.	L3	C03	P03
	b)	Explain the applications of Energy Storage Systems in Electric Vehicles (EVs). Compare Micro Hybrid, Mild Hybrid, Full Hybrid, Plug-in Hybrid, and Electric Vehicles.	L1	C03	PO1
16		Explain the present status of Energy Storage System (EES) applications. Discuss utility and consumer uses of EES.			
17	a)	Describe the role of Pumped Hydro Storage (PHS) in utility applications for time shifting, peak load management, and power quality improvement.	L3	C03	PO1
	b)	Explain the working and applications of Compressed Air Energy Storage (CAES) in electric utilities. Compare the Huntorf and McIntosh CAES plants.	L3	C03	PO1