Reg. No.												

09 JAN 2023

Question Paper Code	11607

M.E. - DEGREE EXAMINATIONS, NOV/DEC 2022

Third Semester

M.E. - Power Electronics and Drives

20PPEEL309 - ADVANCED ENERGY STORAGE TECHNOLOGY

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	What is the need of energy storage?	*2,K1,CO1*
2.	What is meant by main energy storage?	*2,K1,CO1*
3.	List out the different energy transformations.	*2,K1,CO2*
4.	Define potential energy.	*2,K1,CO2*
5.	Define energy capture rate.	*2,K1,CO3*
6.	What is Autonomy?	*2,K1,CO3*
7.	What are the different hydrogen energy storage techniques?	*2,K1,CO4*
8.	What do you mean by hydrogen economy?	*2,K1,CO4*
9.	List the advantages of lead-acid batteries.	*2,K1,CO5*
10.	Why energy storage is important for automotive applications?	*2,K1,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Describe the various types of energy storages with suitable examples.	*13,K2,CO1*
		OR	
	b)	Explain in detail about technical and economical advantages of energy storage.	*13,K2,CO1*
12.	a)	Explain the arrangement of the components of Pumped hydro storage with a neat sketch.	*13,K2,CO2*
		OR	
	b)	With the help of schematic diagram, explain the working of Fuel cells.	*13,K2,CO2*
13.	a)	Explain in detail about environmental considerations, recycling and storage types.	*13,K2,CO3*
		OR	

b) Write short notes on (i) Scale flexibility (ii) Durability (iii) Cycle life time. *13,K1,CO3*

14. a) Explain with a neat sketch, how the pressurized PEM water electrolysis process. *13,K2,CO4*

OR

b) Illustrate the constructional features of hybrid flow batteries in detail. *13,K2,CO4*

15. a) Explain in detail about lead-acid batteries and their applications. *13,K2,CO5*

OR

b) Explain with neat diagram, the energy management system. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Explain the structural features of a "Battery + Capacitor" combination and how the battery charges and discharges? *15,K2,CO4*

OR

b) Explain about the cell balancing topologies for lithium batteries. *15,K2,CO5*