(3 Hours) **[Total Marks: 80]**

N.B. : (1) Question No.1 is compulsory
(2) Attempt any three from the remaining
(3) Figures to the right indicate full marks
(4) Assume suitable data if necessary

1.	(a)	Explain the necessity of energy storage in a conventional power system.	20
	(b)	Illustrate the operation of flow battery.	
	(c)	Describe the principle of operation of fuel cell.	
	(d)	Define SoC of energy storage. Discuss anyone SoC estimation technique for a battery.	
2.	(a)	Give the significance of "electrical double layer" in super-capacitor.	10
	(b)	Explain in detail about latent heat storage.	10
3.	(a)	Illustrate in detail about Compressed air energy storage (CAES).	10
	(b)	What are the solar ponds? Explain with a neat diagram how energy can be stored and utilised from a solar pond?	10
4.	(a)	Explain in detail about Superconducting magnetic energy storage (SMES).	10
	(b)	Explain about electric vehicles as an E-mobility storage applications.	10
5.	(a)	Explain in detail about the Pumped hydro storage system. Give its applications.	10
	(b)	Illustrate operation of Flywheel as a mechanical energy storage device.	10
6.	(a)	Explain the configurations and applications of hybrid energy storage systems (HESS).	10
	(b)	Illustrate the different parameters to be considered while selecting an electrochemical energy storage.	10

****

X525Y0B5501X525Y0B5501X525Y0B5501X525Y0B5501