

Eleet: TE Sem VI Reg C'scheme Summer 2025

(3Hrs)

Marks: 80

N.B.

1. Question No.1 is Compulsory.
2. Answer any three out of remaining five questions
3. Assume any suitable data wherever required but justified the same
4. Illustrate answer with sketches wherever required

Q 1

Attempt any FOUR

- a) Illustrate the application of flywheel as an energy storage device. (05)
- b) Illustrate the operation of seasonal thermal energy storage. (05)
- c) Illustrate the energy storage process in pressurized gas. (05)
- d) Explain the V2X mode of operation of an electric vehicle. (05)
- e) Justify the necessity of an energy storage in electrical power system. (05)

Q 2 a)

Draw the schematic of superconducting magnetic energy storage (SMES) and also, elaborate it's working. (10)

- b) Compare the performance of super capacitor as an energy storage device over a capacitor (10)

Q 3 a)

Explain the working of pumped hydro energy storage technology also mention its advantages, disadvantages, and applications. (10)

- b) Illustrate in detail, any five energy storage technologies. (10)

Q 4 a)

Draw load curves with and without energy storage system and state the advantages of energy storage devices from load curve point of view. (10)

- b) Explain any two battery technologies which can be used as an electrochemical energy storage. (05)

- c) Explain with a neat diagram how energy can be stored and utilized from a solar pond? (05)

Q 5 a)

Illustrate the process of battery sizing for standalone application. (10)

- b) Illustrate the term "Hybrid Energy Storage System" and its applications. (05)

- c) Illustrate the principle of operation of fuel cell. (05)

Q 6 a)

Define SoC of energy storage. Illustrate the types SoC estimation techniques. (10)

- b) What is the necessity of series connection of super capacitor? (05)

- c) Describe battery system model in brief. (05)
