



R18 Regulation

Subject code: 208EA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VIII Semester Supplementary Examinations, April 2024

Energy Storage Systems
(Computer Science and Engineering)

Maximum Marks: 70

Date: 27.04.2024 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each Unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10X2M=20 Marks)

- 1 Why do we need energy storage?
- 2 How will energy storage cut power costs?
- 3 How EES is expected to play an essential role in the future Smart Grid?
- 4 What are the roles of electrical energy storage technologies from the view point of generators of renewable energy?
- 5 What are the most common mechanical storage systems?
- 6 Define Flow batteries
- 7 Name the Thermal storage subdivided into different technologies?
- 8 What are the two main features of double-layer capacitors (DLC) with respect to conventional batteries?
- 9 Write about Internal configuration of battery storage systems?
- 10 Draw the Schematic diagram of Battery SCADA?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Explain briefly Electricity and the roles of EES. [10]
- OR
- 12 Explain the consequences of Congestion in power grids. [10]
 - 13 Write about the Problems in renewable energy installation and possible solutions? [10]
- OR
- 14 Explain the roles of electrical energy storage technologies from the view point of a consumer. [10]
 - 15 Explain the mechanical storage system of pumped hydroelectric power plants (pumped hydro storage, PHS). [10]

OR

16 Explain in detail the chemical energy storage on hydrogen (H₂) system. [10]

17 Write short notes on Superconducting magnetic energy storage (SMES) systems? [10]

OR

18 Write short notes on EES technologies [3+3+4]

a. Short discharge time

b. Medium discharge time

c. Long discharge time

19 Explain the Utility used for conventional power generation, grid operation & service. [10]

OR

20 Briefly describe about Aggregating EES systems and distributed generation (Virtual Power Plant). [10]