

R18

Code No: 158AV

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech IV Year II Semester Examinations, July - 2023

ELECTRICAL DISTRIBUTION SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

- 1.a) Define loss factor. [2]
- b) What do you understand by secondary mains? [3]
- c) Why is voltage drop consideration important in distribution systems? [2]
- d) Mention the factors that are to be considered in selecting ideal substations. [3]
- e) What are the different protective devices used in the distribution system? [2]
- f) State the function of circuit breaker. Give various types of circuit breakers used in distribution system. [3]
- g) What do you understand by powerfactor correction? [2]
- h) What is ferro- resonance? [3]
- i) Define voltage fluctuations. [2]
- j) State the importance of voltage control in distribution system. [3]

PART – B

(50 Marks)

- 2.a) Explain what is meant by (i) Load factor (ii) Diversity factor and (iii) Contribution factor [5+5]
 - b) Discuss the characteristics of different loads. [5+5]
- OR**
- 3.a) How do you choose the primary feeder arrangement from reliability point of view? Discuss the arrangements with the suitable diagrams [6+4]
 - b) What are the factors effecting the feeder voltage level? Explain. [6+4]
4. Discuss the Optimal location of Substations using (a) Perpendicular bisector rule and (b) X, Y co-ordinate method. [10]
- OR**
5. A load survey around a town with 10 km² area indicated that load density is 150 KVA/km² with a load factor of 0.5 and diversity factor is 1.2. Find out the conductor details and %VD for (a) 6.6 kV, 3-phase feeder and (b) 11 kV, 3-phase feeder. [5+5]

- 6.a) How is the coordination between main fuse and sectional fuse achieved? [5+5]
- b) Explain the principle of operation of Auto-Circuit Recloser. [5+5]

OR

7. What is over current protection? Explain the principle of operation of various types of over current relays. [10]

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- 8.a) State and explain different types of power capacitors.
b) How is economic power factor arrived at for a given distribution system with different loads? [4+6]

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- OR**
9.a) Compare and explain the role of shunt and series capacitors in power factor correction. [4+6]
b) Explain the benefits with capacitor installation in distribution systems. [5+5]

10. Explain the following equipment used in voltage control:
a) Induction regulators b) Line drop voltage compensator. [5+5]

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- OR**
11. Explain the following methods in voltage control:
a) Synchronous capacitors b) Tap changing Transformers. [5+5]

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