

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE  
(AUTONOMOUS)

IV B.TECH I SEMESTER END REGULAR EXAMINATIONS, NOV-2022  
ELECTRICAL DISTRIBUTION SYSTEM  
(EEE Branch)

Time: 3 hours

Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

**PART-A**Answer **all** the questions in Part-A (5X2=10M)

| Q.No. | Questions  | Marks | CO | KL |
|-------|--|-------|----|----|
| 1.    | a) Obtain the relationship between load factor and loss factor               | [2M]  | 1  | 2  |
|       | b) List out the factors to be considered to find the location of substations | [2M]  | 2  | 1  |
|       | c) What is meant by voltage drop and its effect on distribution system       | [2M]  | 3  | 1  |
|       | d) What is the purpose of Line sectionalizers                                | [2M]  | 4  | 1  |
|       | e) Define power factor and effect of low power factor in the operation       | [2M]  | 5  | 1  |

**PART-B**Answer **One Question from each UNIT (5X10=50M)**

| Q.No.    | Questions   | Marks | CO | KL |
|----------|---|-------|----|----|
| UNIT-I   |   |       |    |    |
| 2.       | a) Give the classification of loads and draw their characteristics?   | [5M]  | 1  | 2  |
|          | b) The input to a sub-transmission system is 87.6x10 <sup>6</sup> kWh annually. On the Peak load day of the year the peak is 25000kW and the energy input on that day is 3x10 <sup>6</sup> kWh. Find the load factors for the year and for the peak load? | [5M]  | 1  | 3  |
| OR       |   |       |    |    |
| 3.       | a) Discuss the load modeling and its characteristics?   | [5M]  | 1  | 2  |
|          | b) The annual peak load of substation is 3500kW. The annual energy supplied to the Primary feeder circuit is 20x10 <sup>6</sup> kWh. Find: (i) The annual average power demand (ii) The annual load factor  | [5M]  | 1  | 3  |
| UNIT-II  |   |       |    |    |
| 4.       | a) How do you analyze a substation service area with “n” primary feeders?   | [5M]  | 2  | 4  |
|          | b) Draw neat sketches radial type and loop type distribution systems and give its comparison.   | [5M]  | 2  | 2  |
| OR       |   |       |    |    |
| 5.       | a) Explain benefits derived through optimal location of substations?  | [5M]  | 2  | 2  |
|          | b) Give the various loading and voltage level factors that influence the design and Operation of primary feeder?  | [5M]  | 2  | 2  |
| UNIT-III |   |       |    |    |
| 6.       | a) Prove the power loss due to the load currents in the conductors of single phase lateral ungrounded neutral case in two times larger than one in the equivalent three phase lateral.  | [5M]  | 3  | 3  |
|          | b) Discuss the voltage drop for uniformly distributed load  | [5M]  | 3  | 2  |
| OR       |   |       |    |    |

|         |    |   |      |   |   |
|---------|----|---|------|---|---|
| 7.      | a) | Prove that the power loss due to load currents in the conductors of the single phase of two Wire ungrounded lateral with full capacity neutral is 6 times larger than the one in the Equivalent three phase 4- wire lateral.        | [5M] | 3 | 2 |
|         | b) | Discuss voltage drop for loads of different power factor  | [5M] | 3 | 2 |
| UNIT-IV |    |   |      |   |   |
| 8.      | a) | What are the main objectives of distribution protection system? Discuss with the examples?  | [5M] | 4 | 1 |
|         | b) | Discuss about advantages of fuse to fuse coordination   | [5M] | 4 | 2 |
| OR      |    |   |      |   |   |
| 9.      | a) | Write briefly about the principle of operation of i) Fuses ii) Circuit enclosure?   | [5M] | 4 | 2 |
|         | b) | Explain the general co-ordination Procedure of protective devices in radial distribution Systems?   | [5M] | 4 | 2 |
| UNIT-V  |    |   |      |   |   |
| 10.     | a) | What are the differences between fixed and switched capacitors? What are their effects on distribution systems  | [5M] | 5 | 1 |
|         | b) | A 440V, 50 cycle's three phase line delivers 200KW at 0.6 p.f. (lag). It is desired to bring the line p.f. to unity by installing shunt capacitors. Calculate the capacitance if they are: (i) star connected (ii) delta connected? | [5M] | 5 | 3 |
| OR      |    |   |      |   |   |
| 11.     | a) | Explain economic justification and procedure of location of capacitors in distribution Systems?   | [5M] | 5 | 2 |
|         | b) | Why p.f. correction are necessary in distribution systems? What are the disadvantages of low p.f. of the system?  | [5M] | 5 | 2 |

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