R13

Code No: 117CT

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, November/December - 2016
ELECTRICAL DISTRUBUTION SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 Hours   **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A
(25 Marks)

1.a)   What is meant by the term load? How loads can be classified?   [2]
 b)   Define load factor and loss factor.   [3]
 c)   Draw a simple radial secondary system of distribution with a single line diagram. [2]
 d)   What are the factors governing the selection of voltage levels in distribution systems?
                                                                                         [3]
 e)   List out various types of primary and secondary substations.   [2]
 f)   Describe the methods used to calculate power losses in distribution systems.   [3]
 g)   What are the advantages of circuit breakers over fuses?   [2]
 h)   Explain the principle of operation of fuse.   [3]
 i)   Write short notes on Series compensation.   [2]
 j)   Write short notes on Coordination of protective devices.   [3]

PART-B
(50 Marks)

2.a)   Derive the relationship between loss factor and load factor.
 b)   What are the factors to be considered for load forecasting.   [6+4]

OR

3.a)   Discuss about the three factors which affect the distribution system planning in the near future.
 b)   With examples give the classification and explain the characteristics of loads.   [5+5]

4.a)   Discuss the basic design practice of secondary distribution systems.
 b)   Explain various types of radial primary feeders with diagrams.   [5+5]

OR

5.a)   What are the various factors that are to be considered in selecting substation location.
 b)   Assume that a load of 100 KW is connected at the river side of Godavary paper mill. The 15-min weekly maximum demand is given as 75KW, and the weekly energy consumption is 4.2MWh. Assuming a week is 7 days, find the demand factor and the 15-min weekly load factor of the substation.   [5+5]

6.a)   Prove that the power loss in a single phase lateral feeder is two times the power loss in a three phase lateral feeder for transmitting same power.
  b)   In a three phase system the impedance of the line is (R+jx) ohms per phase. Find the load power factor for which the voltage drop is maximum.   [5+5]

OR

7.a)   In terms of resistance and reactance of the circuit, derive the equation for load power factor for which voltage drop is minimum for a uniformly loaded feeder.
  b)   Prove the power loss due to the load currents in the conductors of single-phase lateral ungrounded neutral case is 2 times larger than one in the equivalent three phase lateral.
                                                                                          [5+5]

8.a)   List the objectives of distribution system protection.
  b)   Explain the coordination procedure between two fuses.   [5+5]

OR

9.a)   Discuss clearly the co-ordination of protective devices in a distribution system.
  b)   What are the main objectives of distribution protection? Discuss.   [5+5]

10.a) Compare shunt and series capacitor schemes of compensation.
  b)   What is the need to control the voltage of power system? Explain in detail.   [5+5]

OR

11.a) How a shunt capacitor and reactors can control the voltage? List the disadvantages of using a shunt capacitor for voltage control.
  b)   What are the necessities of Voltage control and p.f. correction in power systems? What are the disadvantages of low voltage and low p.f. of the system?   [5+5]

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