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Code No: 117CT

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech IV Year I Semester Examinations, November/December - 2016****ELECTRICAL DISTRIBUTION 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. [6+4]
 - 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. [5+5]
 - 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. [5+5]
 - 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. [5+5]
 - 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]

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- 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. P6
- 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. P6
- 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. P6
- b) Explain the coordination procedure between two fuses. P6 [5+5]

OR

- 9.a) Discuss clearly the co-ordination of protective devices in a distribution system. P6
- b) What are the main objectives of distribution protection? Discuss. [5+5]

- 10.a) Compare shunt and series capacitor schemes of compensation. P6
- b) What is the need to control the voltage of power system? Explain in detail. P6 [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. P6
- 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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