

Code No: 127CT

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, May/June - 2019

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) Define load factor. [2]
- b) Define diversity factor and coincidence factor. [3]
- c) Write various types of primary feeders. [2]
- d) Write the factors to be considered for feeder voltage level. [3]
- e) Define voltage drop and power loss in DC distribution systems. [2]
- f) Derive the formula for voltage drop uniformly distributed feeder fed from one end. [3]
- g) Write properties fuse element. [2]
- h) Explain the principle of operation of circuit breaker. [3]
- i) Define AVB and AVR. [2]
- j) Define the effect of shunt capacitor in distribution systems. [3]

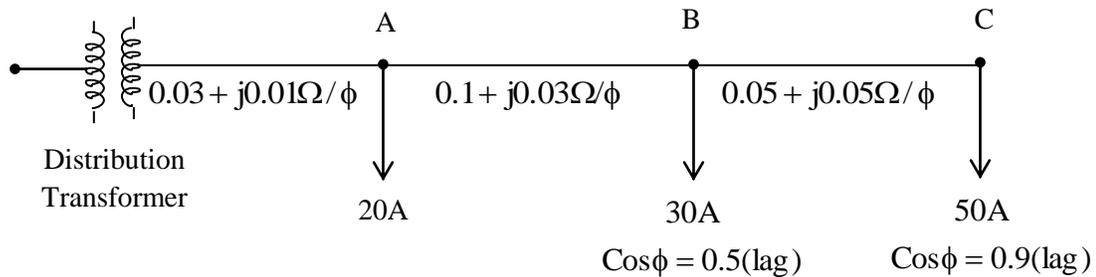
PART-B

(50 Marks)

- 2.a) Explain load modeling in electrical distribution systems.
 - b) Derive the relationship between load factor and loss factor. [5+5]
- OR**
3. Explain the characteristics of residential, Agricultural, industrial and commercial loads with diagram. [10]
- 4.a) What are the various factors that are to be considered for loading of primary feeder.
 - b) Explain basic design practice of secondary distribution system and also discuss about secondary distribution system. [5+5]
- OR**
- 5.a) Draw the layout of 33/11KV distribution substation by showing all components.
 - b) Discuss the benefits derived through optimal location of substations. [5+5]
6. A single phase a.c. distributor AB 400 meters long is fed from end A and is loaded as under :
 - a) 100A at 0.707 p.f. (lag) 200m from point A
 - b) 200A at 0.8 p.f. (lag) 300m from point ATotal resistance and reactance of the distributor is 0.2ohms and 0.15ohms per km. Calculate the total voltage drop in the distributor. The load power factors refer to the voltage at far end. [10]

OR

7. Consider the three phase, three wire 240V secondary system with balanced loads at A, B and C as shown in figure. Determine (a) the total voltage drop in one phase of lateral (b) the real power per phase for each load (c) the reactive power per phase for each load and (d) the KVA output and load p.f. of the distribution transformer. [10]



- 8.a) Write the objectives of distribution system protection.
b) Considering a typical example, describe the procedure for fault current calculations in a distribution system, mentioning the assumptions to be made for the analysis. [5+5]

OR

- 9.a) Explain the principle of operation of line sectionalizer and circuit reclosers.
b) Write co-ordination procedure for protective devices. [5+5]
- 10.a) Discuss the need of power factor improvement in distribution system and explain effect of series capacitor.
b) Explain about line drop compensator. [5+5]
- OR**
- 11.a) Explain need of fixed capacitor and switched capacitor in distribution systems.
b) Write the economic justification to determine the best capacitor location. [5+5]

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