

Code No: RT41029

R13

Set No. 1

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

ELECTRICAL DISTRIBUTION SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Write short notes on the contribution factor. [4]
- b) Discuss briefly about the role of distribution transformer. [4]
- c) What are the differences between the uni grounded and multi grounded neutral systems? [4]
- d) Write the list of protective devices that are used in the distribution system. [4]
- e) What is the effect of low power factor in the distribution system? [3]
- f) Write the list of methods used for voltage control. [3]

PART-B (3x16 = 48 Marks)

2. a) Draw and explain the line diagram of the primary distribution system. [8]
- b) Explain about constant power and constant impedance load models with necessary equation. [8]
3. a) Explain detail about the design considerations of network type distribution feeder. [8]
- b) In a radial feeder the load is connected at the receiving end. The impedance of the feeder is $(0.11+j0.1)$ p.u, the sending end voltage is 1.0p.u, the real load and power factor at the receiving end are 1.0p.u and 0.8 lagging. Determine the receiving end voltage, load angle and find the corresponding values of the receiving end and sending end currents. [8]
4. a) Derive the expression for power loss of a radial feeder with non uniformly distributed load. [8]
- b) A three radial feeder has a voltage of 10.5 kV at the receiving end, a total impedance of $5.25+j10.91$ ohm/ph and the load of 5MW with a lagging power factor of 0.9. Then determine the three phase line and phase voltage at the sending end, load angle and the percentage voltage regulation. [8]
5. a) Derive the expression for fault current of line to ground fault. [8]
- b) An earth fault occurs on one conductor of a three conductor are supplied by a 10MVA, 6.6kV, three phase source with neutral earthed. The source has positive, negative and zero sequence impedances of $(0.5+j4.7)$, $(0.2 + j0.5)$ and $j0.43$ ohms per phase. The corresponding impedance values for the cable up to the fault point are $(0.36+j0.25)$, $(0.36+j0.25)$, $(2.8+j0.9)$ ohms per phase. Find the fault current. [8]
6. a) Explain about different types of power capacitors and their applications. [8]
- b) Discuss in detail about the economic justification of capacitor compensation. [8]
7. a) Explain the effect of series capacitor compensation and its advantages. [8]
- b) What is the need of line drop compensation? Explain how it is done in the distribution systems. [8]