Code: 9A02701

R09

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December 2014

DISTRIBUTION OF ELECTRIC POWER

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) Derive the relationship between load factor and loss factor.
(b) Classify different types of loads with their characteristics.

2 (a) Compare AC and DC distribution systems.
(b) A two wire DC distributor PQ is 2 km long supplies loads of 75 A, 100 A, 150 A and 40 A to points situated at 500 m, 1000 m, 1500 m and 2000 m from the feeding pint P. Each conductor has a resistance of 0.02 Ω/km. If a supply voltage 250 V is maintained at point P, determine the voltage at each load.

3 Draw and explain various types of radial primary feeders.

4 (a) Write different parameters to be considered for location of substation.
(b) Derive the relationship for power loss and voltage drop for substation service area with 'n' primary feeders.

5 (a) Explain methods of improving power factor by shunt and series capacitors.
) (b A 3-phase substation transformer has a name plate rating of 7250 kVA and a thermal capability of 120% of the name plate rating. If the connected load is 8816 kVA with a 0.85 p.f lagging p.f., determine the following:
(i) The KVAR rating of the shunt capacitor bank required to decrease the KVA load of the transformer to its capability level.
(ii) The power factor of the corrected level.

6 (a) Derive the expression for voltage drop and power loss for uniformly radial type distribution load.
(b) A 3-phase unbalanced delta connected load consists of impedance $Z_{AB} = 8\angle 0^0\ \Omega$, $Z_{BC} = 9.5\angle 30^0\ \Omega$, $Z_{CA} = 4.8\angle 45^0\ \Omega$ and is supplied from a 415 V, 3-phase supply of phase sequence ACB. Determine phase current, line current, total active and reactive power taken by the load.

7 (a) Write procedure for economic justification for best capacitor location.
(b) Write the effect of fixed and switched capacitor banks.

8 (a) Explain different common type faults in distribution systems.
(b) Explain principle of operation of fuse and line sectionalizer.

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