Code: EE7T6A

IV B.Tech - I Semester – Regular/Supplementary Examinations
October - 2019
ELECTRICAL DISTRIBUTION SYSTEMS
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer **all** the questions.   All questions carry equal marks

11 x 2 = 22 M

1.

a) List of methods used for voltage control.

b) Define distribution system.

c) Write the characteristics of residential loads.

d) What is the difference between feeder and busbar.

e) List the advantages of ring bus scheme.

f) List out the objectives of distribution system protection.

g) Define coordination.

h) What is the difference between neutral and ground?

i) Define loss factor.

j) What is the difference between transformer and distribution transformer?

k) What is the difference between switched capacitor and fixed capacitor?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2. a) Show and derive the relation between load factor and loss factor. **8 M**

   b) Explain the various factors effecting the distribution system planning. **8 M**

3. a) Consider a single-phase, 2-wire secondary distributor of length 'I' meters from the distribution transformer. At a length of 'I1'' meters from source, a load of I1 amps with a p.f of cosθ1 (lag) is tapped. At a length of 'I2' amps with a power factor cosθ2 (lead) is tapped. At a length of I3 meters from second load, a third load of I3 amps with a UPF is tapped. If resistance and reactance of each wire are r and x ohms/meter respectively, derive approximate voltage drop equation in the distributor. **8 M**

   b) Compare four and six feeder patterns in distribution substations. **8 M**

4. a) Outline the expression for power loss of a radial feeder with non-uniformly distributed load. **8 M**

b) Define secondary banking and explain different connections of secondary banking. 8 M

5. a) Explain the different types of capacitors used in distribution system to improve the power factor. 8 M

b) A 3-phase substation transformer has a name plate rating of 7500 kVA and a thermal capability of 125% of the name plate rating. If the connected load is 8816 kVA with a 0.9 power factor (lagging), determine the following: 8 M

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) Explain the principle of an automatic circuit recloser used in protection of distribution system. 8 M

b) Explain the following 8 M
   i) Fuse-Fuse coordination
   ii) Fuse-Circuit breaker coordination.