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Code No: I5605/R16

M. Tech. I Semester Regular Examinations, January-2017

ELECTRICAL DISTRIBUTION SYSTEMS

[Common to Power Systems(56),PSC &A(53),PSE(30),PS & C(31),ADV PS(50) and EPE(60)]

Time: 3 Hours **Max. Marks: 60**

Answer any FIVE Questions
All Questions Carry Equal Marks

1. Explain the following:
   a. coincidence factor
   b. contribution factor
   c. demand factor
   d. diversity factor
   e. loss factor
   f. load factor
   g. plant factor
   h. utilization factor [12]

2. (a) Discuss the present and future role of computers in distribution systems planning.
   (b) One of the transformers of a substation supplies four primary feeders having a diversity factor 1.25 between them for both real and reactive powers. At the time of annual peak load the demand on each feeder is as follows:

Feeder No.	Demand	Power Factor
1	900 kW	0.85 lag
2	1000 kW	0.90 lag
3	2100 kW	0.95 lag
4	2000 kW	0.90 lag

   Find the maximum kVA demand on the transformer.
   (c) A 120 MW substation deliver 120MW for 3 hours, 60MW for 8 hours and shut down for rest of each day. It is also shut down for the maintenances for 15 days each year. Calculate its annual load factor. [4+4+4]

3. (a) What are the various factors that are to be considered in selecting a primary feeder Rating? Describe the arrangement with suitable diagram.
   (b) Explain how to decide the rating of a distribution substation. [6+6]

4. (a)What are the differences between primary and secondary distribution feeders? Discuss the design considerations of primary and secondary distribution feeders.
   (b) How do you optimally locate the substations and explain the benefits derived from optimal location. [6+6]

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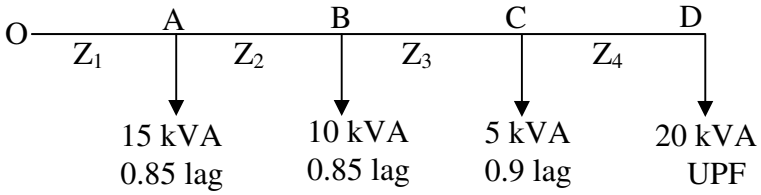
5. (a) Show that power loss due to load currents in the conductors in a single phase two wire ungrounded system with full capacity neutral is six times more than that in the equivalent 3-phase 4-wire system.
(b) The supply voltage of a single phase distribution feeder shown in figure (5b) is 11kV. Estimate the voltage drop, power loss and kVA supplied from the source end. [6+6]



$Z_1=(4+j2)\ \Omega$
$Z_2=(5+j3)\ \Omega$
$Z_3=(5+j3)\ \Omega$
$Z_4=(10+j5)\ \Omega$

Figure (5b)

6. (a) Explain the differences between three-phase balanced primary lines, non-three-phase primary lines.
(b) Derive the voltage drop equation for a non-uniform distributed load. [6+6]

7. (a) Explain the principle of line sectionalizer. How is it coordinated with fuse?
(b) What are the objectives of the distribution system protection? Discuss. [6+6]

8. (a) Explain the effect of shunt capacitor for power factor improvement in distribution system with diagram.
(b) Describe the operation of AVR in the distribution feeder with neat diagram. [6+6]

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