B.E. (Electrical Engineering (Electronics & Power)) Eighth Semester (C.B.S.)

Elective-III : Electrical Distribution System

P. Pages : 3 **NRJ/KW/17/4716**

Time : Three Hours * 0 2 6 0 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Use of non programmable calculator is permitted.

1. a) What is load curve and load duration curve? Explain their importance in distribution network. **6**

b) Define : **4**
1) Coincidence factor
2) Contribution factor
3) Load factor
4) Loss factor

c) Give the classification of Load. **4**

OR

2. a) How the load factor is related to the load factor? Explain its significance. **7**

b) A generating station has a maximum demand of 80 mw and a connected load of 150 mw. **7**
If mwhr generated in a year are 400×10^3. Calculate
a) Load factor
b) Demand factor

3. a) Discuss the arrangement of primary and secondary distribution system? **6**

b) Let points 'A' and 'B' be connected to 250V dc supply. The length of the feeders are AD = 50m, DE = 150m, EB = 400m, BC = 100m and CA = 200m. The resistance per km = 0.2m. **7**
Determine the minimum voltage point.

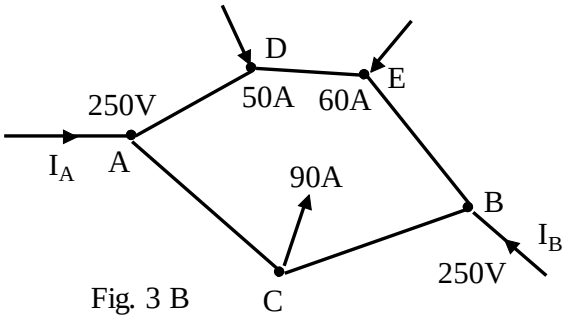

Fig. 3 B

OR

4. a) Draw a line diagram of a radial type primary feeder. Mention the factors that influence the selection of primary feeders. **6**

b) Explain the voltage choice and feeder design for secondary distribution system. **7**

5. a) What are the advantages for adopting 3 - phase - 4 - wire distribution for LT supplies and 3 - phase - 3 -wire for high voltage distribution. **7**

b) A 1 - phase, 230V line has a uniform loading of 700w/100m and one load of 5 KVA at 0.8 P.F. Lag as show in fig. 5 b. Determine the voltage drop and voltage at end of the line. Impedance per 100 m length is 0.14 + j 0.105 and total line length = 1 km. **7**

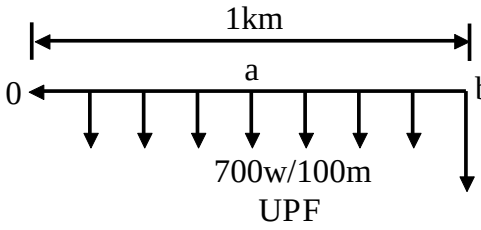

Fig. 5 b

OR

6. a) Derive the expression for voltage drop and power loss for the feeder line with uniformly distributed load. **7**

b) A $^{11kv}/_{\sqrt{3}}$, 1 - phase - single wire system has the following loads. Assuming that there is no phase difference in voltage at different points. Determine the voltage drop and voltage available at the load point 'C' in fig. 6 B. Impedance of line is $(2.5+ j\,1.5)\Omega/km$. **7**

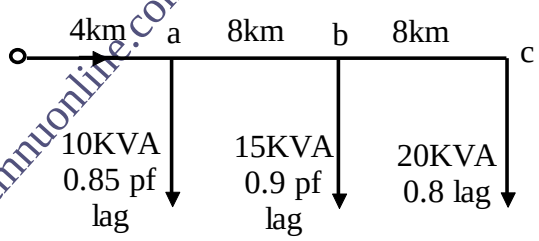

Fig. 6 B

7. a) Briefly explain the line drop compensation and voltage control. **6**

b) A 33KV feeder has $(0.1+ j\,0.25)\Omega$ impedance per phase per km and is supplying a load of 6 MVA over distance of 80km at 0.75 p.f. What will be the receiving end voltage and voltage drop of line if compensated to 50% by series capacitance compensation. **7**

OR

8. a) Explain role of shunt and series capacitors in p.f. corrections. **6**

b) An industry has a total induction motor load of 100 h.p. - efficiency 0.88 and power factor 0.8. It is necessary to correct the p.f. to 0.9 lag. Determine the capacitor bank needed. **7**

9. a) What is distribution Automation? Explain with illustrative example the distribution Automation. **6**

b) Discuss the factors affecting the distribution planning. **7**

OR

10. a) Briefly explain substation Automation. **6**

b) Write short note on data Acquisition system. **7**

11. a) Explain the various factors to be considered to decide the ideal location of substation. **6**

b) Discuss the procedure for fault current calculation in following faults : **7**

1) 3 phase fault

2) single - line - ground fault.

OR

12. a) What is earthing? How it is effectively done? What are the methods of reducing earth resistance. **7**

b) Briefly explain Bus - bar scheme for substation layout. **6**

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