Code No: **R4102A**　　**R10**　　| **Set No. 1** |

IV B.Tech I Semester Supplementary Examinations, October/November - 2017
ELECTRICAL DISTRIBUTION SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours 　　　　　　　　　　　　　　　　　　**Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1　a)　What is loss factor? How is it related to load factor? Explain its significance. [8]

　　b)　The annual peak load of a primary feeder is 1000 kW at which the power loss i.e total copper loss is 40 kW/3∅. Assuming an annual loss factor of 0.12. Determine (i) The average annual power loss (ii) The total annual energy loss due to the copper losses of the feeder circuits. [7]

2　a)　Draw the one line diagram of radial type primary feeder and mention the factors that influence the selection of primary feeder. [10]

　　b)　What are the various factors affecting the design loading of a feeder? [5]

3　a)　How do you analyse a substation service area with 'n' primary feeders. [8]

　　b)　What are rules should be observed for ideal location of substation? [7]

4　a)　Derive the voltage drop and power loss of non-three phase distribution systems and compare to the 3-phase balanced systems. [8]

　　b)　A single phase feeder circuit has total impedance $(0.5 + j0.2)\Omega, V_r = 230\ V$ $I_r = 5\angle - 30^0$. Determine (i) p.f of load (ii) Load p.f for which impedance angle is maximum (iii) Derive the expression for load p.f for which the drop is maximum. [7]

5　a)　What are the main and secondary objectives of distribution protection? [8]

　　b)　Considering a typical example, describe the procedure for fault current calculations in a distribution system, mentioning the assumptions to be made for the analysis. [7]

6　a)　Define the coordination of protective devices. What are the main objectives of properly coordinated protective devices? [8]

　　b)　Write the general coordination procedure. [7]

7　a)　A 3 phases, 400 H.P, 50 Hz, 11 kV star connected an induction motor has a full load efficiency of 80% at lagging p.f of 0.7 and is connected to a feeder. If it is desired to correct the p.f of load to 0.95 lagging. Determine the (i) The size of the capacitor back in kVAr (ii) The capacitance of each unit if the capacitors are connected in Δ as well as in Y. [8]

　　b)　Discuss in brief, the procedure to determine the best capacitor location. [7]

8　a)　Describe the need for voltage control and list out various equipments for voltage control. [8]

　　b)　What is line drop compensation? How is it used along with tap changer of transformer for voltage control? [7]