

**R16**

**Code No: 138BT**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech IV Year II Semester Examinations, September - 2020**

**ELECTRICAL DISTRIBUTION SYSTEMS**

**(Electrical and Electronics Engineering)**

**Time: 2 Hours**

**Max. Marks: 75**

**Answer any Five Questions  
All Questions Carry Equal Marks**

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- 1.a) What is load factor? How is it related to load factor? Explain its significance.
- b) The load curves of two different categories of loads and system peak load are as follows. Determine the diversity factor and coincidence factor for the system.  
Peak load for industrial load =2000 kW; Peak load for residential load =3000 kW and System peak load= 2500 kW. [9+6]
- 2.a) How do you choose the secondary feeder arrangement from reliability point of view? Discuss the arrangements with suitable diagrams.
- b) Give a line diagram of loop (ring) type primary feeder system and mention the different component parts. What are the considerations for planning loop (ring) feeders? [8+7]
- 3.a) What are the factors to be considered for location of a Substation? What are the benefits obtained from optimal location of a Substation?
- b) Explain how do you calculate the rating a distribution substation? [8+7]
- 4.a) Discuss the method to analyze the distribution feeder cost.
- b) Show that the power loss due to the load currents in conductors in a single phase two wire ungrounded system with full capacity neutral (3-wire system) is six times more than that in the equivalent 3-phase 4 wire system. [8+7]
- 5.a) Explain the co-ordination procedure between a main fuse and a sectional fuse?
- b) A single phase, 3-wire distribution line 120V-0-120V, feeds a load of 10KVA line to line and 3KVA on each line to ground. The Transformer is 7620V/240V, 25KVA with 5% impedance. The line impedance is  $j0.05$  per wire. Calculate the fault current and fault MVA for the following:  
i) L-L fault and ii) L-G fault, 1 km from Transformer [8+7]
- 6.a) Explain the coordination procedure between a fuse and auto-recloser.
- b) Explain the principle of operation of Circuit breaker. [8+7]
- 7.a) Compare and explain role of shunt and series capacitors in p.f correction.
- b) An industry has a total induction motor load of 100 h.p, efficiency 90% and power factor 0.82 lagging. It is necessary to correct the p.f to 0.92 lagging. Determine the capacitor bank needed. If the capacitor bank has 3% losses, find the % increase in power take and the p.f with capacitors. [8+7]
8. Explain the different methods for voltage control in distribution systems. [15]