

TRIBHUWAN UNIVERSITY
INSTITUTE OF ENGINEERING
EXAMINATION CONTROL DIVISION

Model Question

Examination	Regular		
Level	BE	Full Marks	60
Programme	BEL	Pass Marks	24
Year/Part	III/II	Time	3 Hrs

Subject: Electric Power Distribution System (ENEE354)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt **All** questions.
- ✓ The figures in the margin indicate **Full Marks**.
- ✓ Assume suitable data if necessary.

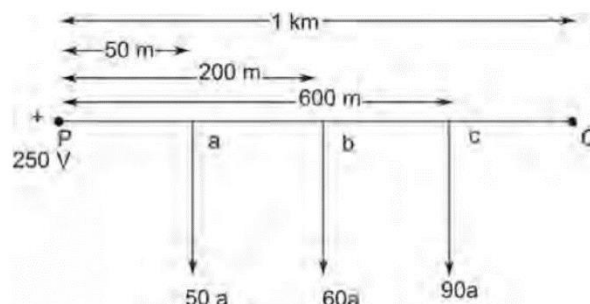
1. State the following statements are TRUE or FALSE? Justify your answer with a brief explanation. [3x4]
 - a) Distribution transformer is connected delta at the high-voltage side and wye at the low-voltage side.
 - b) A single-phase earth return system could be a good choice in the situation with a few large power consuming consumers with scattered settlements.
 - c) Small area load forecasting can be done using S curve.
 - d) There is a transient stability problem in case of distribution system.

2. a) Explain the primary and secondary distribution systems, highlighting their voltage levels and functions. [4]

 b) Compute the power loss & voltage drop for a 15 km long 11 KV 3 phase distribution feeder having sending end current of 100A with uniformly varying load. (Use $R = 0.4 \Omega/\text{km}$, $X = 0.3 \Omega/\text{km}$). Derive any expression used in above calculation. [6]

 c) What is an aerial bundle conductor (ABC)? Discuss the advantage and disadvantage of ABC in LT distribution. [4]

3. a) The feeder in Figure is connected to a 250-V DC supply and has a loading as shown. The resistance of the line is $0.20 \Omega/\text{km}$. Determine the voltage drop and minimum voltage point if the point Q is kept at + 240 V. [6]



b) Discuss the important factors considered in the selection of conductors for distribution lines. [6]

4. a) A 3-phase transformer of 100KVA supplies a load of 75 KVA in its first year of installation and addition 10 KVA for subsequent two years. Calculate the energy loss for third year with following parameters given

Voltage level: 11/0.4 KV No load losses 220 W [6]

Frequency: 50 HZ Copper loss 1200 W

Load Factor: 0.8 Loss of load factor = $0.3 \cdot LF + 0.7 \cdot (LF)^2$

b) With the help of an example distribution feeder show that the node voltage in terms of substation voltage could be expressed as: $[\Delta V] = [BCBV] [BIBC][I]$ Where: $[\Delta V]$: [s/s voltage – node voltage) and $[I]$: [node current]. Also discuss the characteristics of $[BCBV]$ and $[BIBC]$ matrixes. [6]

5. a) Discuss the major factors that must be taken into account for following protection co-ordination. [6]

- i. Recloser to Recloser
- ii. Circuit breaker to recloser

b) Explain briefly about the switched capacitor used in electric power distribution system. [4]