

Time: 3 Hours

Marks: 80

- N.B: 1. Q1 IS COMPULSORY. IN ALL SOLVE FOUR QUESTIONS.
2. IF REQUIRED ASSUME SUITABLE DATA.
3. ALL QUESTIONS CARRY EQUAL MARKS.

Q1 20

- A) DRAW SINGLE LINE DIAGRAM OF TYPICAL A C SUPPLY SYSTEM AND EXPLAIN.
B) EXPLAIN STRING EFFICIENCY.
C) DRAW AND EXPLAIN BUNDLED CONDUCTOR.
D) EXPLAIN PER UNIT SYSTEM AND ITS ADVANTAGE.
E) EXPLAIN FERRANTI EFFECT.
F) DEFINE EARTHING AND ITS TYPES.

Q2 20

- A) DERIVE AN EXPRESSION OF SAG FOR SUPPORT OF EQUAL GROUND LEVEL AND SUPPORT AT UNEQUAL GROUND LEVEL.
B) COMPARE AC AND DC SUPPLY SYSTEM.

Q3 20

- A) A STRING INSULATOR HAS FIVE UNITS EACH RATED FOR 11KV. FIND THE MAXIMUM LINE VOLTAGE ON WHICH IT CAN BE OPERATED SAFELY. THE MUTUAL CAPACITANCE OF UNIT IS 10 TIMES THE CAPACITANCE BETWEEN PIN TO EARTH.
B) PROVE THAT PU IMPEDANCE OF TRANSFORMER CAN BE MADE SAME REFERRED TO BOTH WINDING'S BY SELECTING PROPER VOLTAGE BASES ON EITHER SIDES.

Q4 20

- A) "IN A LIGHTLY LONG TRANSMISSION LINE, RECEIVING END VOLTAGE IS GREATER THAN SENDING END VOLTAGE". JUSTIFY.
B) EXPLAIN MEASUREMENT OF EARTH RESISTANCE AND SOIL RESISTANCE.

Q5 20

- A) A 3 PHASE, 50 HZ, 100KM, LONG OVERHEAD LINE HAS FOLLOWING CONSTANTS. RESISTANCE/PH/KM=0.153 OHM INDUCTANCE/PH/KM= 1.21mH, CAPACITANCE/PH/KM=0.00958 μ F. THE LINE SUPPLIES A LOAD OF 25MVA AT 0.8 P.F.(LAG) AT A LINE VOLTAGE OF 110KV AT RECEIVING END. USING NOMINAL π REPRESENTATION, CALCULATE SENDING END VOLTAGE, SENDING END CURRENT AND SENDING END POWER FACTOR.
B) EXPLAIN SKIN EFFECT AND PROXIMITY EFFECT.

Q6 20

- A) EXPLAIN GRADING OF CABLES AND ITS TYPES.
B) EXPLAIN SURGE IMPEDANCE AND SURGE IMPEDANCE LOADING.