ELEC-E8413 POWER SYSTEMS

EXAM 18.12.2017

ANSWER ONLY TO FIVE OF THE FOLLOWING QUESTIONS:

1. In a 20 kV three phase system the phase current is 15 A and is lagging the phase voltage by 25 degrees. Calculate a) real power, b) reactive power, c) apparent power transmitted.

2. A 50-Hz, 50-MVA transformer with a 132-kV primary and a 33-kV secondary has a reactance of 0.1pu per phase. What is the reactance in ohms per phase: a) referred to the primary; b) referred to the secondary.

3. The effective inductance and capacitance of a faulted system as viewed by the contacts of a circuit breaker are 2 mH and 500 pF, respectively. The circuit breaker chops the fault current when it has an instantaneous value of 100 A. Calculate the restriking voltage set up across the circuit breaker. Neglect resistance.

4. Explain the referring of voltage, current and impedance from the transformer secondary to the primary.

5. Explain load duration curve, load duration time, load factor, diversity factor.

6. Calculate the positive sequence reactance / km of a three phase power line having conductors in the same horizontal plane. The conductor diameter is 7 mm and the distance between outer conductors and the middle conductor is 1.1 meters.

7. Different factors affecting the load current capacity of underground power cables.

Answers accepted in English, Finnish and Swedish.

Questions are available only in English.