ELEC-E8409 HIGH VOLTAGE ENGINEERING

EXAM 11.12.2017

1. Paschen´s law. Explain the meaning of equation $U = f(pd)$. What is Paschen's minimum (pd_{min}), explain it's meaning. Why is breakdown voltage increase in case $pd < pd_{min}$ and why in case $pd > pd_{min}$.

2. Partial discharges in solid insulation. Explain the three-capacitance model.

3. Explain the mechanism of overvoltages when interrupting capacitive currents.

4. Explain the use of dielectric response measurements in power cable insulation condition monitoring. The interpretation of polarization current, inverse polarization current and return (recovery voltage).

5. An overhead line has characteristic impedance of 450 Ω. A 200 kV rectangular impulse 10 km in length propagates along the line. What is the energy of the impulse? How much of the energy is in the magnetic field and how much is in the electric field?

Answers accepted in English, Finnish and Swedish.

Questions are available only in English.