

King Fahd University of Petroleum & Minerals

Electrical Engineering Department

EE 465: Power System Transmission & Distribution
(First Semester 051)

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First Major Exam: October 18, 2005

Q1) [21 points]

Define briefly:

- a) Corona
- b) Shield wires
- c) Ferranti effect

Q2) [35 points]

A 60 Hz, single phase, two wire overhead transmission line has Falcon ACSR conductors. The conductors are arranged in a horizontal configuration with 0.5 m spacing. The conductors' height above the ground plane is 10 m. Calculate the ground plane electric field in kV/m directly under one conductor when the voltage applied is 30 kV.

Q3) [44 points]

A 180 km, 500-kV, 60-Hz, completely transposed overhead transmission line has three ACSR 1113-kcmil conductors per bundle and flat horizontal phase spacing with 10 m, 10 m, and 20 m between bundle centers. The line delivers 1600 MW at 475 kV and at 0.95 power factor leading to the receiving end at full load. The temperature where the line is operating at is 50°C . Using the nominal Π circuit, calculate:

- a) ABCD parameters,
- b) Sending end voltage and current,
- c) Sending end power and power factor,
- d) Full load efficiency,
- e) Percentage voltage regulation.