

UNIVERSITY OF BUEA
COLLEGE OF TECHNOLOGY
SECOND SEMESTER CA 2019/2020

MONTH: JULY
YEAR: 2020

COURSE INSTRUCTOR: T. A. MIH/T.F. FOFANG
COURSE CODE & NUMBER: EEC342
COURSE TITLE: ELECTRIC POWER TRANSMISSION
AND DISTRIBUTION

DATE: Friday 10/07/2020

TIME ALLOWED: 1.5 Hours

TIME: _____

CREDIT VALUE: 4

INSTRUCTIONS: Answer ALL questions. Marks allocation for each sub question is given. You are advised to show clearly every logical step leading to your answer. Good Luck!!

1. A three-phase transmission line is mounted on a tower as illustrated in Figure 1 below. B and C are each d meters from A. Each of the conductors has radius r meters. The three line currents are defined as positive into the paper and the sum to zero.

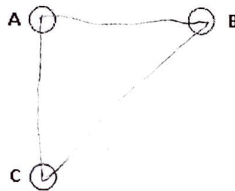


Figure 1: Three-phase transmission line

Determine

- 1.1. The distributed flux per meter, λ_a linking conductor A in terms of I_A , d and r .
 - 1.2. The distributed flux per meter λ_b linking conductor B in terms of I_A , I_B , d and r .
 - 1.3. The distributed flux per meter λ_c linking conductor C in terms of I_A , I_B , d and r . (10 marks)
2. A 50-Hz three-phase, three-wire overhead line has solid cylindrical conductors arranged in the form of an equilateral triangle with 4 ft conductor spacing. Conductor diameter is 0.6 in. Calculate:
- 2.1. The positive-sequence inductance in H/m and the positive-sequence inductive reactance in Ω/km .
 - 2.2. The capacitance-to-neutral in F/m and the admittance-to-neutral in S/km for the three-phase line.
- Neglect the effect of the earth plane. (5x2=10 marks)
3. Rework Problem 2 if the phase spacing is:
- a) Increased by 30%
 - b) Decreased by 10%
- Compare the results with those of Problem 2 (10 marks)