



Daffodil International University
 Department of Electrical and Electronic Engineering
 Faculty of Engineering
Final Examination, Fall – 2025

Course Code: 0713-227

Section: A, B, C

Full Marks: 40

Course Title: Transmission and Distribution of Electrical Power

Level-Term: L2-T2

Exam Date: December 14, 2025

Teacher's Initial: RS

Time: 2 Hours

Answer all questions. CO's in the right side indicate one of the course learning outcomes.

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|-----|--|------------|----|
| Q1. | a) Compare smart grid with traditional grid in perspective of generation, transmission and distribution. | CO1
C-2 | 03 |
| | b) Discuss the major applications of High Voltage Direct Current (HVDC) transmission systems in modern power systems. | CO1
C-2 | 03 |
| | c) Categorize connection schemes of distribution system. | CO1
C-2 | 04 |
| Q2. | a) Draw a comparison between overhead transmission line and underground cable in perspective of installment cost and power loss. | CO2
C-2 | 04 |
| | b) A single core cable for use on 11 kV, 50 Hz, system has conductor diameter 0.906cm and internal diameter of sheath is 2.18 cm. the permittivity of the dielectric used in the cable is 3.5. | CO2
C-4 | 06 |
| | I. Find the maximum electrostatic stress in the cable and
II. Find an expression for the most economical conductor size of a single core cable.
III. Determine most economic conductor size that results in smallest value of maximum stress. | | |
| Q3. | a) What are the disadvantages of low power factor for a supply system? List the equipment that are used for power factor improvement. | CO3
C-2 | 04 |
| | b) A 3-phase, 50 Hz, 3 kV motor develops 600 H.P, the power factor being 0.75 lagging and the efficiency 93%. A bank of capacitors is need to connect in delta across the supply terminals to raised power factor to 0.95 lagging. | CO3
C-5 | 05 |
| | I. Choose the appropriate KVAR rating for the capacitor bank.
II. If each of the capacitance units is built of five similar 600-V capacitors, find the capacitance of each capacitor. | | |
| Q4. | a) Show that the generalized circuit constants for all three transmission line model satisfy the condition that AD-BC=1 . Where A, B, C, and D have their usual meaning. | | 05 |
| | b) A transmission line has a span of 275 m between level supports. Height of the supports is 15 m. The conductor has an effective diameter of 1.96 cm and weighs 0.865 kg/m. If the conductor has ice coating of radial thickness 1.27 cm and is subjected to a wind pressure of 3.9 gm/cm ² of projected area. Weight of 1 c.c. of ice is 0.91 gm. | | 06 |
| | I. If ground clearance of 10 m is to be maintained, calculate working tension T on the conductor.
II. Given a safety factor of 2. Determine the ultimate strength of the conductor. | | |

$$C = \frac{V}{2\pi f g} \quad \begin{matrix} 107.63 \mu F \\ 536.17 \mu F \end{matrix} \quad E_x = \frac{q}{2\pi \epsilon_0 x}$$

$$V = \frac{q}{2\pi \epsilon_0} \ln \frac{D}{d} \quad \underline{1}$$