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Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

Final Examination, Fall – 2025

Course Code: 0713-227 | Course Title: Transmission and Distribution of Electrical Power

Section: A, B, C | Level-Term: L2-T2 | Teacher's Initial: RS

Full Marks: 40 | Exam Date: December 14, 2025 | Time: 2 Hours

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

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. 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.	CO3 C-5	05
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. 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.		06

$C = \frac{V}{275 g}$ 101.63 uF 536.77 uF $E_x = \frac{g}{275 x}$

$V = \frac{g}{275} \ln \frac{D}{d}$ 1