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Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

Final Term Examination, Spring-2025

Course Code:0713-227 | Course Title: Transmission and Distribution of Electrical Power
Section: A, B & C | Level-Term: L2-T2 | Teacher's Initial: KA
Full Marks: 40 | Exam Date: June 18, 2025 | Time: 2.0 Hours

Notes: Question No. 1 & 2 are Compulsory.
Answer any 1 (One) from Question No. 3 & 4

Q1.	a)	**Discuss** the effect of low power factor on power system. **Explain** the power factor improvement by using capacitor using necessary diagram.	CO-1 C-2	04
	b)	**Describe** the importance of voltage control in the modern power system. **Demonstrate** a suitable voltage control equipment to minimize the variations of voltage at the consumer's terminals by maintaining uninterruptable supply to the load.	CO-1 C-4	05
	c)	A single phase 240 V 50 Hz a.c. generator supplies the following loads: 1. Induction motor load of 250 h.p. at p.f. 0·75 lagging. efficiency 93%; 2. Synchronous condenser load of 70 kW at p.f. 0·9 leading; 3. Lighting load of 25 kW at unity power factor. A bank of capacitors is connected across the supply terminals and power factor raised to 0·96 lagging. **Calculate** the capacitance of each capacitor of the capacitor bank if the capacitance unit is built with 4 similar 60V series connected capacitors.	CO-3 C-3	06
Q2.	a)	**Evaluate** the generalized circuit constants for medium transmission line using nominal T method.		04
	b)	A 66 kV, 50 Hz, 3-phase transmission line delivers a load of 30 MW at 0·8 p.f. lagging at the receiving end. The generalized constants of the transmission line are: $A = D = 0{\cdot}79 \angle 2{\cdot}1°$; $B = 80 \angle 80°$ ohm; $C = 0{\cdot}002 \angle 90°$ siemens. **Find** the regulation of the line and charging current. Use Nominal-T method.	CO-2 C-3	05
	c)	A 3-phase, 50 Hz, 100 km transmission line has the following constants; Resistance/phase/km = 0·1 Ω Reactance/phase/km = 0·5 Ω Susceptance/phase/km = 10−5 siemens The line supplies a load of 20 MW at 0·9 p.f. lagging at 66 kV at the receiving end. By using nominal π method, **Determine** i) Sending end Power Factor ii) Transmission efficiency	CO-2 C-3	06
Q3.	a)	With a neat diagram, **show** the various parts of a high voltage single-core underground cable.	CO-1 C-2	03
	b)	**Compare** the relative merits and demerits of underground and overhead transmission line.		03
	c)	**Categorized** the connection schemes of distribution system with necessary layout.		04
Q4.	a)	**Define** feeder and substation? **Classify** substation on basis of service requirement.	CO-1 C-2	03
	b)	**Identify** the main components of smart grid architecture. **Summarize** the potential benefits of smart grid.		03
	c)	Both ends of a two-wire DC distributor AB are fed, 240 V at point A and 250 V at feeding point B. The distributor is 180 meters long overall, and loads are tapped off as follows: 30 A at 25 meters, 25 A at 75 meters, 50 A at 100 meters, and 30 A at 150 meters from point A. One conductor has a resistance of 0·4 Ω per meter. **Determine** the lowest voltage location and its value.		04