



Daffodil International University
Department of Electrical and Electronic Engineering
Faculty of Engineering
Final Term Examination, Spring-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: June 18, 2025

Teacher's Initial: KA

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 04
C-2
- b) Describe the importance of voltage control in the modern power system. CO-1 05
Demonstrate a suitable voltage control equipment to minimize the variations of voltage at the consumer's terminals by maintaining uninterruptable supply to the load. C-4
- c) A single phase 240 V 50 Hz a.c. generator supplies the following loads: CO-3 06
C-3
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.
- 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: CO-2 05
C-3
- $A = D = 0.79 \angle 2.1^\circ$; $B = 80 \angle 80^\circ \text{ ohm}$; $C = 0.002 \angle 90^\circ \text{ siemens}$.
Find the regulation of the line and charging current. Use Nominal-T method.
- c) A 3-phase, 50 Hz, 100 km transmission line has the following constants; CO-2 06
C-3
- Resistance/phase/km = 0.1Ω
Reactance/phase/km = 0.5Ω
Susceptance/phase/km = $10 \times 10^{-6} \text{ siemens}$
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
- Q3. a) With a neat diagram, show the various parts of a high voltage single-core underground cable. CO-1 03
C-2
- 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 03
C-2
- 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 0.4Ω per meter. Determine the lowest voltage location and its value. 04