

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)



B. Tech (Fourth Semester – Regular/Supplementary) Examinations, April 2026
23BELPC24003/23BEEPC24003 – Electrical Power Transmission and Distribution
(EE & EEE)

Time: 3 hrs

Maximum: 60 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A**(2 x 5 = 10 Marks)**Q.1. Answer **ALL** questions

	CO #	Blooms Level
a. Define skin effect.	CO1	K1
b. What are the ABCD constants for a short transmission line?	CO2	K2
c. Describe the load factor in a power system.	CO3	K2
d. Explain the concept of corona in transmission lines.	CO4	K2
e. Define Right of Way (ROW) in power systems.	CO5	K2

PART – B**(10 x 5 = 50 Marks)**Answer **ALL** the questions

	Marks	CO #	Blooms Level
2. a. Derive the inductance of a single-phase two-wire transmission line.	5	CO1	K2
b. A 3-phase 33KV, OH sub transmission line, 20 km long, has its conductor ACSR 10 mm dia. spaced at the corners of an equilateral triangle of 2.5 m side. Find the inductance per phase of the system (OR)	5	CO1	K3
c. Explain bundled conductors and their advantages.	5	CO1	K2
d. Determine the capacitance of a 60 Km long 3-phase, 50 Hz overhead transmission line consisting of 3-conductors each of 1.5 cm diameter and spaced 2.5 meter at the corners of an equilateral triangle.	5	CO1	K3
3.a. Classify transmission lines and explain each type.	5	CO2	K2
b. A 3-phase overhead transmission line delivers a load of 60 MW at 0.8 p.f. lagging and 220 KV between the lines. Its total series impedance per phase and total shunt admittance per phase are $200\angle 80^\circ \Omega$ and $0.0013\angle 90^\circ \text{ mho}$ per phase, respectively. Using the nominal-T method determines the following: i) Sending end voltage ii) Sending end current (OR)	5	CO2	K3
c. What is String efficiency, and how to improve String efficiency	5	CO2	K2
d. An insulator string has three units each having a safe working voltage of 15 kV. The ratio of unit self-capacitance to stray capacitance of earth is 10:1. Calculate (i) The maximum safe working voltage (ii) The string efficiency.	5	CO2	K3
4.a. Explain the structure of a distribution system with a neat diagram	5	CO3	K2
b. Compare radial and ring main distribution systems. (OR)	5	CO3	K4
c. Explain voltage drop in DC distributors.	5	CO3	K3

d.	Explain Kelvin's law and its limitations.	5	CO3	K4
5.a.	Discuss the advantages and disadvantages of underground cables.	5	CO4	K2
b.	A single-core cable has a conductor diameter of 2 cm and an insulation thickness of 0.2 cm. If the specific resistance of the insulation is $5 \times 10^{14} \Omega\text{-cm}$, calculate the insulation resistance for a 2 km length of cable.	5	CO4	K3
(OR)				
c.	Derive the expression for the insulation resistance of a single-core cable.	5	CO4	K3
d.	The insulation resistance of a single-core cable is 495 M Ω per km. If the core diameter is 2.5 cm and the resistivity of insulation is $4.5 \times 10^{14} \Omega\text{-cm}$, find the insulation thickness	5	CO4	K3
6.a.	Describe the different types of surveys conducted for overhead lines.	5	CO5	K2
b.	Explain the planning and construction stages of overhead lines.	5	CO5	K2
(OR)				
c.	Discuss the important factors to be considered during erection of overhead lines	5	CO5	K2
d.	Explain the steps involved in the erection of supports in overhead transmission lines	5	CO5	K2

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