Reg. No.													

Question Paper Code	12038

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL/MAY 2023

Fourth Semester

Electrical and Electronics Engineering

20EEPC402 - TRANSMISSION AND DISTRIBUTION

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Why skin effect is absent in dc system?	2,K1,CO1
2.	What is meant by transposition of line conductors?	2,K1,CO1
3.	Mention the limitations of end condenser method.	2,K1,CO2
4.	Distinguish between short, medium and long transmission line.	2,K2,CO2
5.	Define String efficiency.	2,K1,CO3
6.	Enumerate the different types of insulators used for overhead transmission lines.	2,K2,CO3
7.	What are the methods of grading of cables?	2,K1,CO4
8.	What is the function of sheath in cables?	2,K1,CO4
9.	List out the basic types of FACTS Controllers.	2,K1,CO5
10.	Why transmission lines are 3 phase 3 wire circuits while distribution lines are 3 phase 4 wire circuits?	2,K2,CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	A 50km long transmission line supplies a load of 5MVA at 0.8 power factor lagging at 33kV. The efficiency of transmission is 90%. Calculate the volume of aluminium conductor required for the line when 3-phase, 3 wire systems is used. The specific resistance of Aluminium is 2.85×10^{-8} Ωm.	13,K2,CO1
		OR	
	b)	Derive an expression for the capacitance between conductors of a single phase overhead line.	13,K2,CO1
12.	a)	Derive the expression of regulation and efficiency for medium lines using nominal-T method.	13,K2,CO2
		OR	
	b)	A 3 phase, 50Hz, 100km transmission line has the following constant: Resistance/phase/km=0.153Ω,Inductance/phase/km=1.21mH, Capacitance/phase/km=0.00958μF. If the line supplies a load of 20MW at 0.9 p.f. lagging at 110kV at the receiving end, calculate (i) Sending end current, (ii) Sending end power factor, (iii) Regulation, (iv) Transmission efficiency.	13,K2,CO2

13. a) A 3 unit string is fitted with a guard ring. The capacitance of a link pin to metal work and guard ring can be assumed to be 15% and 5% of the capacitance of each unit. Determine the voltage distribution and string efficiency. *13,K2,CO3*

OR

b) Discuss briefly on the following :-
(i) Pin type insulator. *6,K2,CO3*
(ii) List the effect of Wind and ice loading in sag calculations. *7,K2,CO3*

14. a) A 33 kV single core cable has a conductor diameter of 1 cm and a sheath of inside diameter 4 cm. Find the maximum and minimum stress in the insulation. *13,K2,CO4*

OR

b) (i)What are the advantages of underground cables over overhead lines? *7,K2,CO4*
(ii) List out the properties of insulating materials used for the cables. *6,K2,CO4*

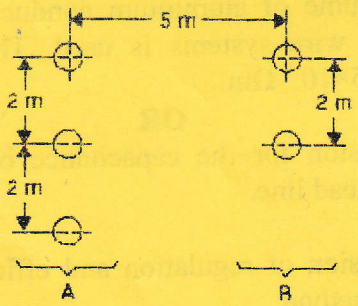
15. a) Explain the following.
(i) Indoor substations. *7,K2,CO5*
(ii) Interconnected system Distribution. *6,K2,CO5*

OR

b) An electric train taking a constant current of 600 A moves on a section of line between two substations 8km and maintained at 575 and 590 volts respectively. The track resistance is 0.4 Ω/km both goes and returns. Find the point of minimum potential along the track and currents supplied by two substations at that instant. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Determine the inductance of a 1-phase transmission line having the following arrangement of conductors. One circuit consists of three wires of 2 mm dia each and the other circuit two wires of 4 mm dia each as shown in fig. *15,K2,CO1*



OR

b) Calculate the horizontal component of tension and maximum sag for a span of 300m if the maximum tension in the conductor is 3500 kg and weight of the conductor is 700 kg/km. Determine also the location of the points on the conductor at which the sag will be half of the above value. *15,K2,CO3*