BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/2022)

CLASS: **BTECH** **SEMESTER : V**
BRANCH: **EEE** **SESSION : MO/2022**

SUBJECT: EE307 ELECTRIC POWER TRANSMISSION AND DISTRIBUTION

TIME: **03 Hours** **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

Q.1(a)	Define two part and three part tariff.	[2]
Q.1(b)	With example explain how load curve and load duration curve are related ?	[3]
Q.1(c)	A generating plant has a maximum capacity of 100 kW and the total annual cost is Rs 1,60,000 out of which the fixed cost is 12%. Find the fixed charges per kWh if the load factor is (i) 100% and (ii) 50%.	[5]
Q.2(a)	What is skin effect? why it is absent in the DC system?	[2]
Q.2(b)	The three conductors of a 3-phase line are arranged at the corners of a triangle of sides 2 m, 2·5 m and 4·5 m. Calculate the inductance per km of the line when the conductors are regularly transposed. The diameter of each conductor is 1·24 cm.	[3]
Q.2(c)	Draw a three phase double circuit line Write the steps in calculating inductance per phase per km of the drawn three phase double ckt line. Consider the line is completely transposed..	[5]
Q.3(a)	With the help of diagram, show and explain the various parts of an underground cable	[2]
Q.3(b)	Find an expression for the most economical conductor size of a single core cable.	[3]
Q.3(c)	In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find (i) the distribution of voltage over 3 insulators and (ii) string efficiency.	[5]
Q.4(a)	What is a sag in overhead lines? Discuss the disadvantages of providing too small or too large sag on a line.	[2]
Q.4(b)	With an example, show that the voltage at the load buses of a radial system is improved if the system is converted to a ring system with the same source.	[3]
Q.4(c)	A 2-wire DC distributor cable AB is 2 km long and supplies loads of 100A,150A,200A and 50A situated 500 m, 1000 m, 1600 m and 2000 m from the feeding point A. Each conductor has a resistance of 0·01 Ω per 1000 m. Calculate the p.d. at each load point if a p.d. of 300 V is maintained at point A.	[5]
Q.5(a)	Define voltage regulation and transmission efficiency as applied to transmission line.	[2]
Q.5(b)	Define Ferranti effect and reason of occurrence with proper equations.	[3]
Q.5(c)	A 3-phase, 50 Hz, 16 km long overhead line supplies 1000 kW at 11kV, 0·8 p.f. lagging. The line resistance is 0·03 Ω per phase per km and line inductance is 0·7 mH per phase per km. Calculate the sending end voltage, voltage regulation and efficiency of transmission.	[5]

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