BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID-SEMESTER EXAMINATION MO/2023)

CLASS: **B.TECH** **SEMESTER: V**
BRANCH: **EEE** **SESSION: MO/2023**

SUBJECT: EE307 ELECTRICAL POWER TRANSMISSION AND DISTRIBUTION
TIME: **02 Hours** **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and a total 25 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**

			CO	BL
Q1.	Write the justification in a maximum of two sentences.			
(a)	A higher Load factor for generating units indicates more utilization of the unit.	[1.5]	1	2
(b)	Capital investment becomes less for a higher diversity factor of loads.	[1.5]	1	2
(c)	The demand factor is always less than one.	[1.5]	1	2
(d)	The advantage of a block rate tariff is that the consumers consuming more electrical energy get an incentive.	[1.5]	1	2
(e)	Resistance, inductance, and capacitance of transmission line are developed due to the resistivity of the material, magnetic and electric field.	[1.5]	2	2
Q.2(a)	Differentiate between Load Curve and Load Duration Curve with proper diagrams. Mention the importance of these two curves in power system operation.	[2]	1	2
Q.2(b)	A 100 MW power station delivers 100 MW for 2 hours. 50 MW for 6 hours and is shut down for the rest of the day. It is also shut down for maintenance for 45 days each year. Calculate its annual load factor.	[3]	1	3
Q.3(a)	Calculate the inductance of a 100 km long 3-phase, 50 Hz overhead transmission line consisting of 3- conductors, each of diameter 2 cm and spaced 2.5 m at the corners of an equilateral triangle	[2]	2	3
Q.3(b)	Derive the equations of the inductance of a 3-phase transmission line having unsymmetrical spacing. Comment on the equations and what can be done to overcome drawbacks. Justify with equations	[3]	2	3
Q.4(a)	Derive the capacitance of a single-phase line.	[2]	2	3
Q.4(b)	Instead of using other tariffs, What are the reasons for applying power factor(pf) tariff for industrial consumers? Explain with proper equations. How is pf tariff different from the part tariff?	[3]		
Q.5(a)	What are the benefits of stranded ACSR conductors and bundle conductor?	[2]	2	1
Q.5(b)	Why Skin effect is present only in AC system? How does it affect the equation for resistance calculation?	[3]	2	1

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