BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2024)

CLASS: B.TECH **SEMESTER : V**
BRANCH: EEE **SESSION : MO/2024**

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 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
Q.1.	Keep the answers to the following questions with a maximum of two sentences. Use the appropriate equation for the answer, if necessary. a) Why is the diversity factor kept at the desired level from the perspective of power system operation? b) Why is the demand factor required for planning purposes? c) Why is the power factor tariff essential for industry customers? d) Why is the double circuit line used for power transmission? e)Why is there a requirement to use a bundle conductor?	1x5	1 and 2	1 and 2
Q.2(a)	A generated station has a connected load of 600 MW. The maximum demand is 380 MW. The number of units generated per annum is 2100 X 10^6. Calculate the load factor.	[2]	1	3
Q.2(b)	Draw the single line diagram (SLD) showing typical voltage values of the primary and secondary sides of transformers used in SLD. Explain the effects of high voltage transmission based on the line loss and voltage drop in transmission lines.	[3]	1	2
Q.3(a)	Write the inductance matrix of three phase asymmetrical spaced conductors and the same for transposed lines. Derive the voltage drop equations for both the cases of three phase lines and write your observations.	[2]	2	4
Q.3(b)	A two-conductor, single-phase line operates at 50 Hz. The diameter of each conductor is 30mm and the spacing between the conductor is 2m, calculate (i) the Inductance of each conductor per km (ii) the loop inductance of the line per km (iii) the inductive reactance per km	[3]	2	3
Q.4a)	Calculate annual bill of a consumer whose maximum demand is 100 kW, p. f. = 0·8 lagging and load factor = 60%. The tariff used is Rs 75 per kVA of maximum demand plus 15 paise per kWh consumed.	[2]	1	3
Q.4(b)	Differentiate uniform tariff, two part tariff and three part tariff with examples.	[3]	1	2
Q.5(a)	What is Skin effect? What is its cause and effect?	[2]	2	1
Q.5(b)	Derive the capacitance of a single phase line.	[3]	2	2

:::::19/09/2024:::::M