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

CLASS: B.TECH. **SEMESTER: VII**
BRANCH: EEE **SESSION: MO/2022**

SUBJECT: EE437 INDUSTRIAL DRIVES AND CONTROL

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. **The total marks of the questions are 25.**
2. **Candidates attempt for all 25 marks.**
3. **Before attempting the question paper, be sure that you have got the correct question paper.**
4. **The missing data, if any, may be assumed suitably.**
5. **Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**

				CO	BL
Q1	(a)	List applications of Electrical Drives in different industries.	[2]	CO1	BL1
Q1	(b)	Briefly discuss criteria for the choice of an electrical drive for different applications.	[3]	CO1	BL1
Q2	(a)	Draw a block diagram of generalized electrical drives.	[2]	CO2	BL2
Q2	(b)	Explain the role of power converters in electrical drives.	[3]	CO2	BL2
Q3	(a)	Discuss the steady-state stability of a drive. Give an example of a stable point of operation and an unstable point of operation by drawing motoring speed-torque characteristics and load speed-torque characteristics in each case.	[2]	CO3	BL3
Q3	(b)	A drive has rotational inertia 10kg/m^2. Its speed (N) torque (T) characteristics is given by ($\boldsymbol{T = 100 - 0.1N}$) newton-meter. Passive load torque characteristics is (T_L = 0.05N) newton-meter. N is the speed in rpm. Initially, the drive is operating in the steady state. If the motor speed-torque characteristics is changed to ($\boldsymbol{T = -100 - 0.1N}$) newton-meter. Calculate the time of reversal if the motor reaches steady state.	[3]	CO3	BL3
Q4	(a)	Briefly explain different classes of motor duty.	[2]	CO4	BL4
Q4	(b)	Derive the thermal model of a motor.	[3]	CO4	BL4
Q5	(a)	Derive speed torque characteristics of DC series motor.	[2]	CO5	BL5
Q5	(b)	Design a starter of DC hunt motor using limiting resistances. Show the Circuit diagram and briefly explain.	[3]	CO5	BL5

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