CBCS SCHEME

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BMT402

Fourth Semester B.E./B.Tech. Degree Supplementary Examination, June/July 2024

Electrical Drives and Control

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With a neat block diagram, explain different components of an electrical drives.	10	L2	CO1
	b.	Derive an expression for torque in an electric motor and show the relationship between speed and torque.	10	L3	CO1
		OR			
Q.2	a.	With a neat graph, explain the four-quadrant operation of an electric motor driving a load.	10	L2	CO1
	b.	With suitable equations, explain in detail load torque components.	10	L3	CO1
		Module – 2			
Q.3	a.	Explain different modes of operation of an electrical drive.	10	L2	CO2
	b.	Derive an expression for thermal model of motor for heating and cooling.	10	L3	CO2
		OR			
Q.4	a.	Explain the following classes of motor ratings: i) Intermittent periodic duty with starting and braking. ii) Continuous duty with starting and braking.	10	L2	CO2
	b.	Discuss in detail classification of an electrical drive.	10	L2	CO2
		Module – 3			
Q.5	a.	With a neat diagram, explain the construction and working of 3-point starter.	10	L2	CO3
	b.	Discuss different types of electric braking.	10	L2	CO3
		OR			
Q.6	a.	With suitable illustration, explain the concept of half wave drives and full wave drives.	10	L2	CO3
	b.	With suitable voltage and current waveforms, explain chopper fed DC drives.	10	L3	CO3

		Module – 4			
Q.7	**a.**	Explain the construction and working of single phase induction motor.	**10**	**L2**	**CO4**
	b.	With a neat sketch, explain the permanent magnet AC motor control structures with silent features.	**10**	**L2**	**CO4**
		OR			
Q.8	**a.**	With suitable equation. Illustrate regenerative braking in single phase induction motor.	**10**	**L3**	**CO4**
	b.	Examine capacitor split-phase motors with its characteristics.	**10**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	With a neat block diagram, explain thyristor converter fed separately excited DC motor.	**10**	**L2**	**CO4**
	b.	Explain the main stages of control system design of microprocessor based variable speed drives.	**10**	**L2**	**CO4**
		OR			
Q.10	**a.**	List and brief the functions of a microprocessor in variable speed drives and electric motors.	**10**	**L2**	**CO4**
	b.	With a neat diagram, explain the closed loop control of stepper motor.	**10**	**L2**	**CO4**

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