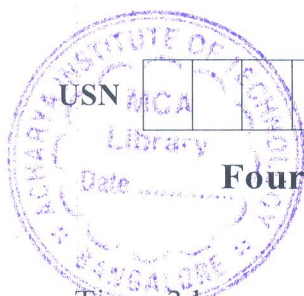


# CBCS SCHEME



BMT402

## Fourth Semester B.E. Degree 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
1	a.	Explain the components and functions of electric drive system with a neat block diagram.	10	L2	CO1
	b.	Derive an expression for Torque in an electric motor with load and show the relationship between speed and torque.	10	L2	CO1
<b>OR</b>					
2	a.	Outline the various classes of load torque and show the representation of speed Vs torque.	10	L2	CO1
	b.	With a neat graph, explain the four quadrant operation of an electric motor driving a load.	10	L2	CO1
<b>Module – 2</b>					
3	a.	Derive an expression for thermal model of an electric motor and plot the heating and cooling curves to represent the same.	10	L2	CO2
	b.	Summarize the motor rating classification for the following : i) Continuous duty ii) Short-time and intermittent duty.	10	L2	CO2
<b>OR</b>					
4	a.	Illustrate the speed control of methods in electric DC motor with circuits and graphs.	10	L2	CO2
	b.	A constant speed drive has the following duty cycle : i) Load rising from 0 to 400KW : 5 min ii) Uniform load of 500 KW : 5 min iii) Regenerative power of 400KW returned to supply : 4min Estimate power rating of motor. Assume losses to be proportional to (power) <sup>2</sup> .	10	L2	CO2
<b>Module – 3</b>					
5	a.	Explain various types of starting methods used in DC motors.	10	L2	CO3
	b.	Derive the basic machine equations for the circuit configuration of DC motor.	10	L3	CO3
<b>OR</b>					
6	a.	With a neat sketch, explain the phase controlled rectifier fed Dc drives with waveforms.	10	L2	CO3
	b.	Illustrate the guardant operation of DC separately excited motor ted from fully controlled rectifier with waveforms.	10	L 2	CO3
<b>Module – 4</b>					
7	a.	With neat sketch, explain the construction and working of single phase induction motor. Mention its advantage and limitations.	10	L2	CO4
	b.	Illustrate the capacitor – split phase motor and its starting method with a neat circuit and phase diagram.	10	L3	CO4

OR

8	a.	Outline the construction and working of permanent magnet motors. List advantages and limitations over brushed motors.	10	L3	CO4
	b.	With a neat block diagram, explain the Variable Frequency Drive (VFD) to control the speed in AC motors.	10	L2	CO4
<b>Module – 5</b>					
9	a.	Brief the requirements of firing angle controller in microprocessor based drives.	10	L2	CO5
	b.	Explain the working of separately excited DC motor drive using a microprocessor with neat diagram.	10	L2	CO5
<b>OR</b>					
10	a.	Explain the feature of stepper motor and show the working of stepper motor with a simple closed loop system.	10	L2	CO5
	b.	Outline the various stages in design of control system for micro processor based variable speed drives.	10	L2	CO5

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