Reg. No.															

Question Paper Code	13724

M.E. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Second Semester

M.E. - Power Electronics and Drives

24PPEPC202 - SOLID STATE DC DRIVES

Regulations - 2024

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Define dynamic torque.	2	K1	CO1
2.	Name the speed control of DC motor drives.	2	K1	CO1
3.	Recall the effect of current ripple in continuous current operation.	2	K1	CO2
4.	List the performance parameters in three-phase converter control of a separately excited DC motor.	2	K1	CO2
5.	Compare between three phase and single phase controlled drives.	2	K2	CO3
6.	Define the duty cycle of chopper.	2	K1	CO3
7.	State the limitations of using a linear transfer function model for power converters.	2	K1	CO4
8.	List the advantages and disadvantages of using transfer function models in drive system analysis.	2	K1	CO4
9.	Recall the control algorithm used for open-loop and closed-loop operation of DC drives.	2	K1	CO5
10.	Define current feedback in electrical drive systems.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	Explain any two methods of speed control in DC motor.	13	K2	CO1
		OR			
	b)	Demonstrate the Ward-Leonard speed control of dc motor with neat sketch.	13	K2	CO1
12.	a)	Explain with relevant diagrams the single phase fully controlled rectifier fed dc separately excited motor.	13	K2	CO2
		OR			
	b)	Explain the working of three phase converter DC drives with a neat diagram and necessary waveforms.	13	K2	CO2

13.	a)	Outline the operation of four quadrant chopper fed dc separately excited motor drive with necessary diagrams.	*13*	*K2*	*CO3*
		OR			
	b)	Discuss the motor performance parameters and input supply performance parameters of Single Phase DC Drives.	*13*	*K2*	*CO3*
14.	a)	Summarize in detail the design of current controller of closed loop control system of dc separately excited dc motor.	*13*	*K2*	*CO4*
		OR			
	b)	Explain and derive the transfer function of a separately excited dc motor.	*13*	*K2*	*CO4*
15.	a)	Explain with a program flow chart the load distributed operation micro computer control of dc drive.	*13*	*K2*	*CO5*
		OR			
	b)	Explain the with a program flow chart the constant horse power micro computer control of dc drive.	*13*	*K2*	*CO5*

PART - C (1 × 15 = 15 Marks)

16.	a) (i)	Summarize the advantages and disadvantages of using a proportional-integral-derivative controller.	*7*	*K2*	*CO4*
	(ii)	Summarize the working performance of sensors used for speed detection circuits.	*8*	*K2*	*CO5*
		OR			
	b) (i)	Summarize the current feedback in the context of DC drive systems.	*7*	*K2*	*CO4*
	(ii)	Explain the Phase Locked Loop (PLL) in the context of DC drives.	*8*	*K2*	*CO5*