Course Code: 1960215 Roll No: MLRS-R19

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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III B.Tech II Sem Regular End Examination, June 2022

Power Semiconductor Drives
(Electrical and Electronics Engineering)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	Explain the use of freewheeling diode in the converter fed d.c drives?	2M	CO1	BL4
	b)	What are the advantages of three phase drives over single phase drives?	2M	CO1	BL1
	c)	What is duty cycle? Give its significance in case of chopper fed d.c drives.	2M	CO2	BL1
	d)	What is four quadrant operation?	2M	CO2	BL1
	e)	What are the advantages of variable frequency control of Induction Motors?	2M	CO3	BL1
	f)	What is an A.C voltage Controller?	2M	CO3	BL1
	g)	State the disadvantages of static rotor resistance control in case of Induction motors?	2M	CO4	BL1
	h)	What is a slip power recovery system?	2M	CO4	BL1
	i)	State the concept of self controlled synchronous motor by cycloconverter.	2M	CO5	BL1
	j)	What are the advantages of self controlled synchronous motor by VSI?	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2	Explain the operation of single phase full converter fed dc separately excited dc motor using motoring mode?	10M	CO1	BL4
	OR			
3	Explain the operation of three- phase fully controlled converter connected to DC series motor.	10M	CO1	BL4
4	What are the advantages of electric braking? Explain plugging, dynamic and regenerative braking techniques in case of dc motor?	10M	CO2	BL4
	OR			
5	The chopper used for on-off control of a dc- separately excited motor has supply voltage of 230V dc, an on time of 10m sec and off time of 15msec, neglecting armature inductance and assuming continuous conduction of motor current, calculate the average load current when the motor speed is 1500 rpm and has a voltage constant of Kv=0.5 V/rad per sec. Ra=3 ohm.	10M	CO2	BL3

6	a)	What are the advantages of variable frequency drives?	5M	CO3	BL1
	b)	Constant torque loads are not suitable for A.C voltage controller fed induction motor drive. Why?	5M	CO3	BL1
		OR			
7		Explain the operation of stator voltage control of induction motor and how it can be implemented by power converters?	10M	CO3	BL4
8	a)	Bring out the merits and demerits of static Scherbius drive.	5M	CO4	BL1
	b)	Draw the block diagram of static Scherbius drive.	5M	CO4	BL1
		OR			
9		Draw and explain a closed-loop operation of a static Kramer controlled drive.	10M	CO4	BL4
10		Explain the operation of load commutated CSI fed synchronous motor. Also, draw the relevant waveforms	10M	CO5	BL4
		OR			
11		Draw the block diagram of a closed loop synchronous motor drive fed from VSI and Explain the function of each block.	10M	CO5	BL4

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