Q.P. Code: 19EE0227 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations November/December-2022

POWER SEMICONDUCTOR DRIVES

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		With neat diagram, explain 1-Ø fully controlled converter fed by separately excited DC motor in continuous conduction mode.	L1	12M

OR

2		A 100KW, 440V, 1000 rpm dc motor running at 800rpm and developing 75% rated torque is controlled by a 3-Ø, 6-pulse Thyristor converter. If the back EMF at rated speed is 410V, determine the triggering angle of the converter. It is fed with a 3-Ø, 415V, and 50Hz ac supply.	L3	12M

UNIT-II

3	a	Explain the operation of closed loop speed control of dc drive.	L2	6M
	b	A 230V, 870rpm, 100A separately excited DC motor has an armature resistance of 0.02Ω. It is coupled to an over hauling with a torque of 400N-m. Determine the speed at which motor can hold the Load by regenerative braking.	L3	6M

OR

4	a	Draw and explain operation of torque control by using closed loop control of DC Drives.	L2	6M
	b	Draw and explain operation of current limit control	L2	6M

UNIT-III

5		Explain the operation of first quadrant chopper fed by separately excited DC motor with necessary waveforms.	L1	12M

OR

6	a	A 230V, 10A, 1500rpm separately excited dc motor with armature resistance of 1.5Ω motor operates under dynamic braking with chopper control. Braking resistance has a value of 15Ω. (i) Calculate the duty ratio of chopper for motor speed of 1200rpm and braking torque equal to 2 times the rated motor torque. (ii) What will be the motor speed for duty ratio of 0.6 and motor torque equal to twice the rated torque?	L3	6M
	b	Explain the closed loop speed control of dc motor and show how it can be achieved by a chopper.	L5	6M

UNIT-IV

7	a	Explain voltage control method of Induction motor drive?	L2	6M
	b	A 3-Ø, 400V, 50Hz, 6 pole star connected induction motor has the following parameters (referred to stator): R1=R2=0.15Ω, X1=X2=0.8Ω. Determine the initial braking torque if the motor is braked by plugging the full load the slip is 0.04.	L4	6M

OR

8		Explain briefly voltage source inverter control of induction motor.	L2	12M

UNIT-V

9	a	Explain the operation of self - control of synchronous motor.	L2	6M
	b	Discuss the operation of separate -control of synchronous motor.	L2	6M

OR

10		Discuss the operation of a voltage source inverter fed synchronous motor in the true synchronous mode.	L2	12M

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