O.P.Code: 20EE0225	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year II Semester Regular &Supplementary Examinations June-2025

POWER SEMICONDUCTOR DRIVES

(Electrical & 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.	CO1	L4	12M
		OR			
2		The speed of a 20HP, 210V, 1000rpm series dc motor is controlled by a 1-Ø fully controlled converter. The combined field and armature circuit resistance is 0.25Ω , Kaf=0.03N-m/ A2 and Kres=0.075 V-S/rad. The supply voltage is 230V. Assuming continuous and ripple free motor current, determine the following for a firing angle α=300 and speed N=1000 rpm. Find (i). The motor torque (ii). The motor current (iii). The supply power-factor	CO1	L3	12M

UNIT-II

3		Explain in detial about: a) Plugging b) Dynamic braking c) Regenerative braking	CO2	L2	12M
		OR			
4	a	Draw and explain operation of current limit control.	CO2	L2	6M
	b	Explain the operation of closed loop speed control of dc drive.	CO2	L2	6M

UNIT-III

5		Describe how the operation of second quadrant can be obtained from chopper fed by separately excited DC motor.	CO3	L2	12M
		OR			
6		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?	CO3	L3	12M

UNIT-IV

7	a	Explain voltage control method of Induction motor drive.	CO4	L2	6M
	b	Explain stator- frequency control method.	CO4	L2	6M
		OR			
8		Explain the speed control method for 3-Ø induction motor bu using Cycloconverter.	CO4	L2	12M

UNIT-V

9	a	Explain the operation of self - control of synchronous motor.	CO5	L2	6M
	b	Discuss the operation of separate -control of synchronous motor.	CO5	L2	6M
		OR			
10		Explain variable frequency control of synchronous motor by PWM technique.	CO5	L2	12M

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