Question Paper Code: R18A32EE03

R18

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech II Semester Supplementary Examinations, December-2024

POWER SEMICONDUCTOR DRIVES

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max. Marks: 75**

Section – A (Short Answer type questions) (25 Marks)

Answer All Questions		Course Outcome	B.T Level	Marks
1.	Draw the Speed – Torque Characteristics of DC series motor controlled by single phase semi converter.	CO1	L2	2M
2.	What are the advantages and application of single phase fully controlled converters fed DC Motors	CO1	L1	3M
3.	Draw the Speed – Torque Characteristics of DC separately excited motor controlled by 3- phase fully controlled converter.	CO2	L2	2M
4.	Draw output voltage and current waveforms of 3- phase semi controlled converter.	CO2	L1	3M
5.	What are the different types of electric braking techniques?	CO3	L2	2M
6.	Define Chopper and what are applications of Choppers?	CO3	L2	3M
7.	Draw the characteristics of variable voltage control of induction motor.	CO4	L2	2M
8.	Mention the difference between Kramer's drive and Scherbius drive.	CO4	L1	3M
9.	Mention the advantages of synchronous motors drives.	CO5	L1	2M
10.	Write the principle of self-control of synchronous motor	CO5	L2	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	Explain the operation of single phase semi-controlled converter connected to DC separately excited motor and draw voltage current wave forms for continuous current operation.	CO1	L2	10M
	OR			
B)	A 230 V, 1000 rpm, 10 A separately excited DC motor is fed from a single phase full converter with AC source voltage of 200 V, 50 Hz, Ra = 5 Ω. The armature current is continuous. Determine the firing angle for rated motor torque at 750 rpm.	CO1	L2	10M
12. A)	Explain the working operation of three phase fully-controlled converter connected to DC separately excited motor with neat sketch.	CO2	L2	10M
	OR			
B)	A 440 V, 1000 rpm, 15 A separately excited DC motor has armature resistance and inductance of 1 Ω and 10 mH. The motor is controlled by a three phase Semi converter fed with source voltage 230 V, 50 Hz. Calculate the developed torque for $\alpha = 30^0$ and speed 800 rpm.	CO2	L3	10M

13. A)	Explain the differences between plugging, dynamic breaking and regenerative breaking.	CO3	L3	10M
	OR			
B)	Discuss the operation of four quadrants DC Chopper fed separately excited DC motor with neat sketch.	CO3	L3	10M
14. A)	Illustrate the operation of V/f control of 3-phase induction motor with neat diagrams.	CO4	L2	10M
	OR			
B)	Explain about static rotor resistance control of induction motor with neat diagram and draw the speed-torque characteristics.	CO4	L2	10M
15. A)	Discuss the separate control operation of synchronous motor with neat block diagram.	CO5	L3	10M
	OR			
B)	Explain the Operation of self-controlled synchronous motors by VSI cycloconverter with a suitable block diagram.	CO5	L3	10M