Reg. No. | | | | | | | | | | | | |
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B.E / B.TECH. DEGREE EXAMINATIONS, MAY 2023
Third Semester
EE18352 – ELECTRICAL DRIVES AND CONTROL SYSTEMS
(Electrical and Electronics Engineering)
(Regulation 2018A)

TIME:3 HOURS **MAX. MARKS: 100**

CO 1 Operate and describe the characteristics of dc and ac motors.
CO 2 Start, brake and control the speed of dc and ac motors.
CO 3 Understand the operation of converters, choppers, inverters and ac voltage controllers.
CO 4 Outline the closed loop control schematics for dc, ac drives.
CO 5 Use dc, ac drives and special machines for the given application.

PART- A(10x2=20Marks)
(Answer all Questions)

		CO	RBT LEVEL
1.	What are the three modes of operation for electric drive ?	1	2
2.	Why the group drive is not used extensively ?	1	2
3.	What are the three region in the speed-torque characteristics of the induction motor ?	2	1
4.	Why is starter necessary for a DC motor ?	2	2
5.	Write the expression for average output voltage of full converter fed DC drives.	3	1
6.	State the control strategies of choppers.	3	1
7.	What are the advantages of closed loop speed control ?	4	2
8.	Give the factors to be considered for the selection of controller.	4	2
9.	Define step angle.	5	1
10.	Write the characteristics of SRM.	5	2

PART- B (5x 14=70Marks)

		Marks	CO	RBT LEVEL
11. (a)	Explain the different classes of motor duty with a neat sketch.	(14)	1	3

(OR)

11 (b)	Explain what is meant by group drive. What are its advantages and disadvantages ?	(14)	1	3

12. (a)	Explain the modifications to the speed-torque characteristics of a dc shunt motor for the following:(i) With increase in armature resistance (ii) By field weakening.	(14)	2	3

(OR)

12. (b)	Draw and explain the operation of autotransformer starter for induction motors.	(14)	2	3
13. (a)	A chopper used for ON and OFF control of a dc separately excited motor has supply voltage of 200V, T_{on}=15ms, T_{off} =20ms. Neglecting armature inductance and assuming continuous conduction of motor current. Calculate the average load current when the motor speed is 200 rpm, it has a voltage constant K_v= 0.5 V/rad/sec. The armature resistance is 4 Ω.	(14)	3	3

(OR)

(b)	Explain the various speed control techniques of squirrel cage three phase induction motors.	(14)	3	3
14. (a)	Explain the closed loop control with stator voltage control of three phase squirrel cage induction motor using necessary block diagram.	(14)	4	3

(OR)

(b)	Explain the closed loop control with static scherbius drive of three phase SRIM using necessary block diagram.	(14)	4	3
15. (a)	With the sketch demonstrate the construction and working principle of permanent magnet stepper motor two phase ON mode operation.	(14)	5	3

(OR)

(b)	Explain the construction and working principle of BLDC motor also compare conventional DC motor and BLDC motor.	(14)	5	3

PART- C (1x 10=10Marks)
(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	With a neat diagram explain the principle of operation of 2 point starter which is used for DC series motor.	(10)	2	3

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