Q. Code:117097

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

B.E./ B.TECH. DEGREE EXAMINATIONS, MAY 2024

Third Semester

EE18352–ELECTRICAL DRIVES AND CONTROL SYSTEMS

(Mechanical Engineering)

(Regulation 2018/2018A)

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

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

PART- A(10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	What is meant by Multi-motor drive? Give an example.	**1**	**2**
2.	Mention the functions of Power modulators.	**1**	**2**
3.	Why regenerative braking is not possible ion DC Series motor without modification?	**2**	**3**
4.	Draw the torque-slip characteristics of a three phase squirrel cage induction motor.	**2**	**3**
5.	List the various methods of speed control of DC motor.	**3**	**3**
6.	Frequency control is not normally used. Why?	**3**	**2**
7.	Define closed loop control system.	**4**	**2**
8.	Mention the some applications of microprocessor.	**4**	**2**
9.	The stepper motor has a step angle of 1.80 and is driven at 4000rps. Determine (a) Resolution (b) Rotor speed.	**5**	**3**
10.	Compare PMBLDC motor with PMSM.	**5**	**2**

PART- B (5x 14=70Marks)

			Marks	CO	RBT LEVEL
11. (a)	**(i)**	Briefly explain the various factors that will influence the choice of an electrical drive.	**(7)**	**1**	**3**
	(ii)	Explain the disadvantages of using a motor of incorrect rating.	**(7)**	**1**	**3**
		(OR)			
(b)		Explain the different classes of motor duty with the equations.	**(14)**	**1**	**3**

12. (a)	**(i)**	Explain the various methods of braking of induction motors.	**(8)**	**2**	**3**
	(ii)	Draw and explain the electrical and mechanical characteristics for the DC shunt motor.	**(6)**	**2**	**3**
		(OR)			
	(b)	Draw a neat schematic diagram of a Three point starter and explain its working.	**(14)**	**2**	**3**
13. (a)	**(i)**	Explain Time ratio control and Current limit control.	**(6)**	**3**	**3**
	(ii)	Explain the single phase half wave converter drive speed control for DC drive with waveforms.	**(8)**	**3**	**3**
		(OR)			
	(b)	Explain the working of following methods with neat circuit diagram. i) Kramer system ii) Scherbius system.	**(14)**	**3**	**3**
14. (a)		Distinguish between open loop and closed loop system. Explain Closed Loop current Control and closed loop speed control of DC drives.	**(14)**	**4**	**3**
		(OR)			
	(b)	With the block diagram, explain the DC motor drive using a microprocessor.	**(14)**	**4**	**3**
15. (a)		Describe in detail the construction and working of variable reluctance stepper motor.	**(14)**	**5**	**3**
		(OR)			
	(b)	Explain the operation of electronic commutator in PMBLDC motor with necessary diagrams. Explain the operation of the same.	**(14)**	**5**	**3**

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

			Marks	CO	RBT LEVEL
16.		Describe with a neat circuit any two configuration of power converters used for the control of switched reluctance motor.	**(10)**	**5**	**4**

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