A **Reg. No. :** | | | | | | | | | | |

Question Paper Code:53324

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Chemical Engineering

15UEE324-ELECTRICAL DRIVES AND CONTROL

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The heating time constant of an electrical machine gives an indication of its CO1 R

   (a) Rating (b) Cooling

   (c) Short time rating (d) Over load capacity

2. The basic elements of a electric drive are CO1- R

   (a) Electric motor (b) Control system

   (c) Electric motor and control system (d) None of these

3. Polarity of supply voltage is reversed in which type of braking? CO2- R

   (a) Regenerative braking (b) Plugging

   (c) Dynamic braking (d) None of these

4. The motor used in household refrigerators is CO2- R

   (a) Dc series motor (b) Dc shunt motor

   (c) Universal motor (d) Single phase induction motor

5. For the protection of DC series motor, which starter is commonly used? CO3- R

   (a) Two point starter (b) Three point starter (c) Four point starter (d) None of these

6. As compared to squirrel cage induction motor, a wound rotor induction motor is preferred when the major consideration is CO3- R

(a) High starting torque (b) Low windage losses

(c) Slow speed operation (d) All of the above.

7. When smooth and precise speed control over a wide range is desired, the motor preferred is CO4- R

(a)) Synchronous motor (b) Squirrel cage induction motor

(c) Wound rotor induction motor (d) DC motor

8. A chopper is a CO4- R

(a)Time ratio controller (b) AC to DC converter

(c) DC transformer (d) High speed semiconductor switch

9. A 4-pole three-phase induction motor has a synchronous speed of 1500 rev/ minute. The frequency of supply to the stator is CO5- R

(a) 50 Hz (b) 100 Hz (c) 12.5 Hz (d) 25 Hz

10. The concept of V/f control of inverters driving induction motors results in CO5- R

(a) Constant torque operation (b)Reduced magnetic loss

(c) Speed reversal (d) Harmonic elimination

PART – B (5 x 2= 10 Marks)

11. Mention any three factors influencing the choice of electrical drives. CO1-R

12. Draw the speed- torque characteristics of a typical DC shunt motor. CO2- R

13. State the necessity of starter for DC motors. CO3- R

14. Write the expression for frequency of operation of a DC chopper. CO4- R

15. Point out the salient features of Voltage /frequency control. CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Draw and explain the block diagram of an electrical drive system. Also explain the advantages of electrical drives. CO1- App (16)

Or

	(b)	For a typical motor, analyze the heating and cooling curves and also derive an expression for maximum temperature rise of the motor.	CO1- App	(16)
17.	(a)	Draw a typical speed- torque curve of a three phase induction motor. Explain the significance of this curve and also derive an expression for starting torque developed in a three phase induction motor.	CO2- App	(16)
		Or		
	(b)	Mention the various methods employed for braking in a DC motor. Explain the principles involved in regenerative braking of a typical DC motor.	CO2-Ana	(16)
18.	(a)	Describe the working of a three point starter with a neat diagram. Explain the significance of various protective circuits used in this starter.	CO3- U	(16)
		Or		
	(b)	A typical DC series motor has to be started with a suitable starter. Describe the working of this starter and its advantages.	CO3- U	(16)
19.	(a)	Draw the circuit diagram for Ward- Leonard control system and describe how speed control of DC drive is achieved using this control system.	CO4- U	(16)
		Or		
	(b)	A typical DC motor is fed with single phase fully controlled rectifier circuit. Explain the operation of this circuit to control the speed of the DC motor. Draw the required control circuit.	CO4- U	(16)
20.	(a)	With a neat diagram and necessary equations, describe how speed control of a three phase induction motor is performed using stator voltage control method.	CO5- U	(16)
		Or		
	(b)	Draw the circuit diagram for an inverter- fed induction motor drive. Explain how speed control can be achieved for this inverter fed three phase induction motor drive.	CO5- U	(16)

53324