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

Question Paper Code: 96301

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Sixth Semester

Electrical and Electronics Engineering

19UEE601 – Electric Drives and Control

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. During Deceleration of a DC motor (T= Motor torque, TL =Load Torque) CO1- R

   (a) 3000 rpm (b) 1500 rpm (c) 1000 rpm (d) 4000 rpm

2. Electric drive is becoming more and more popular because_____ CO1- U

   (a)it is simple and reliable (b) it provide smooth and easy control

   (c) it is cheaper in cost (d) All of the above

3. Which braking is not possible in series motor? CO1-R

   (a) regenerative (b) dynamic (c)plugging (d) All of the above

4. The DC motor, which can provide zero speed regulation at full load without any controller is CO2-U

   (a) Series (b) Shunt

   (c) Cumulative Compound (d) Differential Compound

5. For an IM to operate in braking region slip should be always _____ CO3-U

   (a)is equal to 1 (b) less than zero (c) greater than 1 (d) None of these

6. The concept of V/f control of inverters driving induction motors results in _____ CO3- Ana

   (a) Voltage controlled current source (b) voltage controlled voltage source

   (c) Current controlled voltage source (d) current controlled current source

7. The back emf set up in the stator of a synchronous motor will depend on CO4- U

(a) rotor speed only (b)rotor excitation only

(c)rotor excitation and rotor speed (d) coupling angle, rotor speed and excitation

8. The maximum value of torque that a synchronous motor, can develop without losing its synchronism, is known as CO4- R

(a) breaking torque (b)synchronizing torque (c) pull out torque (d) slip torque

9. Current limit control is employed to limit _____ CO3- R

(a) motor current (b) converter current

(c) both a and b (d) none of the above

10. Current is sensed by _____ CO3- R

(a) Current sensors (b)Hall effect sensors

(c) Tachometer (d) both a and b

PART – B (5 x 2= 10 Marks)

11. What is meant by electrical drives? CO1- U

12. Explain the function of a freewheeling diode in a phase controlled rectifier? CO2- U

13. What are the various applications of stator voltage control scheme? CO3 -U

14. Mention the two modes employed in variable frequency control CO4 -U

15. How will you select the motor rating for a specific application? CO5 -U

PART – C (5 x 16= 80Marks)

16. (a) Explain in detail about multi quadrant operation of electric drives CO1- U (16)

Or

(b) Discuss the different classes of duty of motors and also explain the method of determination of power rating. CO1- U (16)

17. (a) Explain the continuous conduction mode of operation of three phase fully controlled converter fed separately excited dc motor in detail with necessary waveforms and equations? CO2- U (16)

Or

(b) Explain the two & four quadrant operation of chopper fed dc separately excited motor drive with necessary diagrams. CO2- U (16)

18.	(a)	Explain the speed control scheme of induction motor drive with stator voltage control and also state the disadvantages of this method.	CO3- U	(16)
		Or		
	(b)	Explain in detail, the v/f control of induction motor drives.	CO3- U	(16)
19.	(a)	Draw the open loop volts/Hz speed control of multiple PM synchronous motors and volts/Hz speed control characteristics in torque –speed plane.	CO4- U	(16)
		Or		
	(b)	With necessary diagram explain the closed loop speed control of load commutated inverter synchronous motor drive	CO4- U	(16)
20.	(a)	Illustrate the operation of a closed loop scheme for speed control of a dc motor, below the rated speed.	CO5- U	(16)
		Or		
	(b)	Develop the transfer function model of a speed controller. .	CO5- U	(16)

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