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Question Paper Code: 42842

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018 In the many cost in house was W. Third Semester and many town their bases Mechanical Engineering ME 2205 – ELECTRICAL DRIVES AND CONTROL (Regulations 2008)

Time: Three Hours Maximum: 100 Marks

Answer ALL questions.

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- 1. What are the types of elctric drives?
- 2. Draw block diagram of an electrical drive system.
- 3. Draw the mechanical characteristic of a three phase induction motor.
- 4. What are the methods of braking of electric motors?
- 5. State the basic principle in DOL for 3-phase induction motor.
- 6. What is the basic principle in starting 3-phase induction motor using rotor resistance starter?
- 7. What is meant by a d.e to d.c converter drive?
- 8. List the applications of d.c. choppers.
- 9. What are the advantages of V/f control of three-phase induction motors?
- 10. Mention the advantages of slip power recovery scheme of controlling the speed of induction motor.

PART – B. Land and J. Land (5×16=80 Marks)

11. a) Explain the procedure for selection of power rating for drive motor with regard to thermal limits and load variation factors.

(OR)

b) Determine the half-an-hour rating of a 40 KW motor having the thermal time constant of 2HRS. Assume that the constant losses are 80% of variable losses at full load.

12.	a)	 i) Explain, with necessary circuit diagram, the reverse current braking and the braking characteristics of the following: 	
			5)
		2) DC series motor.	5)
		ii) A 250 V, DC shunt motor has an armature resistance of $0.05~\Omega$ and with rated field excitation has a back emf of 245 V at a speed of 1200 rpm. It is coupled to an overhauling load with a torque of 200 N-m. Determine the lowest speed at which the motor can hold the load by regenerative	(0)
		braking. (OR)	(6)
	b)	i) Sketch the speed-torque characteristics of a three phase induction motor are explain its motoring mode, generating mode and braking mode of	nd
		operation.	(8)
(83		ii) A 15 kW, 415 V, three-phase, 4 pole, 50 Hz induction motor has a speed of 1455 r.p.m. at full load. At this load, the mechanical losses are 600 watt	
		and the stator losses are 750 watt. Find with a second and the stator losses are 750 watt. Find with a second and the stator losses are 750 watt. Find with a second and the stator losses are 750 watt. Find with a second and the stator losses are 750 watt.	Ĭ.
		2) Total input power to motor.	2
		3) Current drawn at full load, if the power factor is 0.8 lagging.	
		THE RESIDENCE OF THE PROPERTY	8)
13.	a)	Describe with diagram working of 3-point starter for DC shunt motor. (1	6)
		(OR) notice principle in DOL for 8-phase induction (SO) m.	
	b)	With diagram explain auto transformer starter for three phase induction motor. (1	6)
14.	a)	With a diagram explain ward Leonard control system of speed control of D.C. Motor. (1	6)
		(OR)	3
	h)	List the applications of d.c. choppers.	8
	D)	With a circuit explain speed control strategies of D.C. Motor using first quadrant chopper. (1	6)
15.	a)	Explain the static Scherbius drive which provides speeds below and above synchronous speed. (1	6)
		(OR)	
(82	b)	Explain the constant torque mode and constant power mode of operation of voltage source inverter fed induction motor drive with necessary diagrams. (1	6)
		to thermal limits and load variation factors.	

b) Determine the half-an-hour rating of a 40 KW motor having the thermal time constant of 2MRS. Assume that the constant losses are 80% of variable losses at full load.