

Reg. No.																			
----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code	12646
---------------------	-------

M.E. / M.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Second Semester

M.E. - Power Electronics and Drives
20PPEPC201 - SOLID STATE AC DRIVES

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. List the applications of induction motors drives.	2	K1	CO1
2. How is the speed of a squirrel cage induction motor controlled?	2	K1	CO1
3. Compare voltage source and current source inverter fed drives.	2	K2	CO2
4. List the various types of braking in PWM inverter-based IM drives.	2	K1	CO2
5. List the advantages of controlling the speed of an induction motor from rotor side.	2	K1	CO3
6. Name the two types of static scherbius system.	2	K1	CO3
7. Constant torque loads are not suitable for AC voltage controller fed induction motor drive. Why?	2	K1	CO4
8. Recall the importance of vector control in induction motor drives.	2	K1	CO4
9. What are the characteristics of self-controlled mode operated synchronous motor?	2	K1	CO5
10. List the starting methods of synchronous motors.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Infer the development of rotating magnetic field and torque production in a three-phase induction motor with suitable diagrams.	13	K2	CO1
OR			
b) Outline any two braking methods employed in three phase induction motor in detail.	13	K2	CO1
12. a) How speed reversal can be achieved in induction motor? Explain with neat diagram.	13	K2	CO2
OR			
b) Illustrate the operation of six pulse VSI fed induction motor drives with neat diagram.	13	K2	CO2

13. a) Using a diagram and torque speed curve, explain the stator voltage control scheme for the speed control of a three phase induction motor. 13 K2 CO3

OR

- b) Outline the slip power recovery scheme applicable for the three phase slip ring induction motor with neat diagram. 13 K2 CO3

14. a) Summarize the direct torque control of induction machines with neat diagram. 13 K2 CO4

OR

- b) Outline the torque expression with stator and rotor fluxes of an induction motor. 13 K2 CO4

15. a) Explain the closed loop control scheme of adjustable speed synchronous motor. 13 K2 CO5

OR

- b) Compare the brush and brushless excitation systems in synchronous motor drives with suitable diagrams. 13 K2 CO5

PART - C (1 × 15 = 15 Marks)

16. a) Explain various types of braking in induction motor drives and discuss the operation of PWM inverter in dynamic braking method. 15 K2 CO2

OR

- b) Summarize the self control and separately control of synchronous motor fed from VSI. Compare the above two schemes. 15 K2 CO5