

Reg. No. :

Question Paper Code : 20511

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Third Semester

Manufacturing Engineering

EE 8353 — ELECTRICAL DRIVES AND CONTROLS

(Common to : Mechanical Engineering / Mechanical and Automation Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is an electric drive?
2. Distinguish between group and individual electric drive.
3. What are the advantages of electric braking?
4. What are the components of load torques?
5. State the types of DC motor starters.
6. List the advantages of slip ring induction motor.
7. Mention the methods to control the speed of a DC shunt motor.
8. State the merits of dc chopper drives.
9. Give the applications of induction motors drives.
10. What is meant by slip power?

PART B — (5 × 13 = 65 marks)

11. (a) Elaborately discuss the different classes of motor duty.

Or

- (b) Describe in detail the factors that influence the choice of electrical drives.

12. (a) Discuss any two braking methods of DC shunt motors with neat diagram.

Or

- (b) Explain dynamic braking method of an AC induction motor.

13. (a) Explain the working of two point starter with neat diagram.

Or

- (b) With neat diagram, discuss the working of three phase slip ring induction motor starter.

14. (a) Discuss the speed control of DC shunt motor using DC choppers. Mention the advantages and applications.

Or

- (b) Explain the construction and working of ward – leonard speed control system with a neat diagram. List the applications.

15. (a) Explain the slip power recovery control of slip ring induction motor in detail.

Or

- (b) Explain the variable voltage variable frequency method of speed control of 3 phase induction motors for full range of speed control.

PART C — (1 × 15 = 15 marks)

16. (a) A 220 V shunt motor has armature and field resistance of 0.2Ω and 220Ω respectively. The motor is driving a constant load torque and running at 1000 rpm drawing 10 A current from the supply. Calculate the new speed and armature current if an external armature resistance of value 5Ω is inserted in the armature circuit. Neglect armature reaction and saturation

Or

- (b) Analyse the auto transformer and star-delta starters for AC motors.