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**Question Paper Code : 57311**

**B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Third Semester**

**Mechanical Engineering**

**EE 6351 – ELECTRICAL DRIVES AND CONTROLS**

**(Common to Mechanical and Automation Engineering, Production Engineering,  
Manufacturing Engineering, Petrochemical Engineering, Chemical Engineering and  
Petrochemical Technology)**

**(Regulations 2013)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. List the basic elements of electrical drives.
2. Define thermal overloading.
3. Draw speed-torque characteristics of a traction load.
4. What is meant by 'braking of electrical motor' ?
5. Why starter is necessary to start a electrical motor ?
6. State the difference between three phase squirrel cage and slip-ring induction motors.
7. List the advantages and disadvantages of D.C. Choppers.
8. Give the applications of controlled rectifier circuit.
9. List the types of speed control methods in three phase induction motor.
10. What is AC voltage Regulator ?

**PART - B (5 × 16 = 80 Marks)**

11. (a) Discuss the following :
- (i) Heating and cooling curves (8)
  - (ii) Classes of duty (8)

**OR**

- (b) (i) Describe the factors influencing the choice of electrical drives. (8)
- (ii) Discuss about selection of power rating for drive motors. (8)

12. (a) (i) Draw and explain the Speed-Torque Characteristics of DC shunt, series and compound motors with necessary equations. (10)
- (ii) Draw and explain the Speed-Torque Characteristics of three phase induction motor. (6)

**OR**

- (b) What are the different methods used for braking of electrical motors ? Explain all the methods with neat diagrams. Also explain which method is suitable for which electrical motor. (16)

13. (a) Explain typical control circuits in starter for shunt and series motors. (16)

**OR**

- (b) Explain typical control circuits in starters for the three phase slip ring induction motors. (16)

14. (a) Explain armature and field control of D.C. motors using controlled rectifiers. (16)

**OR**

- (b) Explain armature and field control of D.C. Motors using D.C. Choppers. (16)

15. (a) Explain speed control of three phase induction by combined voltage/frequency control. (16)

**OR**

- (b) Explain slip power recovery scheme for the speed control of 3 phase induction motor. (16)