

B 2192

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Third Semester

Mechanical Engineering

EE 252 — ELECTRICAL MACHINES AND DRIVES

(Common to Mechatronics Engineering)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of electric drive?
2. What are the factors governing the size and rating of the motor?
3. What are the conditions for the stable operations of motors?
4. Draw the slip-torque characteristics of a single phase induction motor.
5. Why a starter is necessary for a DC Motor?
6. Name the various types of starters commonly used for starting an induction motor?
7. What are the two main methods adopted for speed control of dc shunt motors?
8. Write the speed equation of an induction motor.
9. What are the advantages of thyristor control on speed control of dc motor?
10. What are the choices of power supply in underground coal mine?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the factors governing the selection of motors. (16)

Or

- (b) Discuss in detail the determination of power rating of motors? (16)

12. (a) (i) List out the advantages and disadvantages of electric braking over mechanical braking? (8)
(ii) Discuss any one method of electric braking of dc machines. (8)

Or

- (b) Explain the speed torque characteristics of 3ϕ induction motor with neat diagram. (16)
13. (a) Draw a neat schematic diagram of a 3 point starter and explain its working. (16)

Or

- (b) Explain with neat circuit diagram, the star-delta starter method of starting squirrel cage induction motor. (16)
14. (a) A 500 V series motor having armature and field resistances of 0.2 and 0.3 ohm respectively runs at 500 rpm when taking 70 amps. Assuming unsaturated field, find out its speed when field diverter of 0.684 ohm is used constant torque load. (16)

Or

- (b) Explain the operation of induction motor from variable frequency supply. (16)
15. (a) Explain with neat sketch the chopper control method of speed control dc motors. (16)

Or

- (b) Draw the power circuit arrangement of three phase variable frequency inverter for the speed control of three phase induction motor and explain its working. (16)