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Question Paper Code : 51848

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

Third Semester

Mechanical Engineering

**ME 2205 / ME 36 / EE 1205 A/080 120013/10122 ME 306 – ELECTRICAL DRIVES
AND CONTROL**

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

(Regulations 2008/2010)

**(Also common to 10122 ME 306 – Electrical Drives and Control for B.E. (Part-Time)
Second Semester – Mechanical Engineering – Regulations 2010)**

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. List any four classes of insulation used in motors with their maximum temperature ratings.
2. What are the different classes of motor duty ratings ?
3. What are cumulative and differential compound motors ?
4. What is meant by plugging ?
5. A starter is needed for a DC motor. Justify.
6. Why is it that DC series motors should not be started on no load ?
7. What are the factors controlling the speed of a DC motor ?
8. Bring out the advantages of DC chopper controlled DC drives with that of line commutated converter controlled DC drives.
9. How the direction of rotation of a three phase induction motor be reversed ?
10. What is an inverter ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) List the advantages of electric drives. (6)
(ii) Brief the procedures for selection of power rating for drive motor with regards to thermal limits and load variation factors. (10)

OR

- (b) Briefly explain about the classes of motor duty based on load time variations with diagrams. (16)
12. (a) Explain the various electrical braking methods employed for braking of dc motors. (16)

OR

- (b) (i) Briefly explain the speed torque characteristics of an Induction motor with a neat sketch. (8)
(ii) Draw and explain the speed torque characteristics of DC series and shunt motor. (8)
13. (a) Draw a neat sketch of a 3 point starter for a DC shunt motor and explain its operation. Also explain the protective devices therein. (16)

OR

- (b) (i) Explain with a circuit diagram the starting of an induction motor by star delta starting. (8)
(ii) Brief the starting of slip ring induction motors by rotor resistance starter. (8)
14. (a) (i) With a neat sketch of fully controlled thyristor bridge circuit explain the speed control of a separately excited DC motor and plot its speed torque characteristics. (10)
(ii) Describe with a neat sketch the field current control of a DC motor. (6)

OR

- (b) (i) Explain the Ward Leonard method of speed control of DC motors. (10)
(ii) Distinguish between single quadrant and two quadrant operation of the chopper. (6)
15. (a) (i) Explain the V/f method of speed control of induction motor. (8)
(ii) Brief the speed control of an induction motor by rotor resistance. (8)

OR

- (b) Discuss a slip power recovery scheme applicable for a 3 Φ slip ring induction motor for operation below synchronous speed. Also derive an expression for no load speed. (16)