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**Question Paper Code : C 1248**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2010.

Third Semester

Mechanical Engineering

EE 1213 — ELECTRICAL DRIVES AND CONTROLS

(Common to B.Tech. Production Technology)

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Group drive system.
2. Give the formulae for computing power requirement for a linear movement.
3. Sketch the mechanical characteristics of DC shunt and Series motor in the same graph.
4. What is meant by dynamic braking?
5. State the difference between three point and four point starters.
6. Why is rotor resistance starter only suitable for slip ring induction motor?
7. How the speed of induction motor is more than its synchronous speed in static Kramer system?
8. How is the variable armature voltage obtained in Chopper based DC motor control? Sketch the speed torque characteristics of an induction motor for stator voltage control.

9. List out the advantages of slip power recovery scheme speed control of AC motor.
10. Draw the block diagram of soft starter.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Briefly explain the various factors that will influence the choice of an electrical drive. (8)
- (ii) Explain the method of estimating equivalent continuous power rating of a motor for short time load applications. (8)

Or

- (b) (i) Explain the different classes of Motor duty with the equations. (12)
- (ii) The temperature rise of motor after operating for 30 minute on full load is 20°C and after another 30 minute it become 30°C on the same load. Find the final temperature rise and time constant. (4)
12. (a) (i) From electrical characteristics, derive the mechanical characteristic of DC series motor. (8)
- (ii) Why is a 1-phase induction motor not self starting? Also describe any one method of starting a 1-phase induction motor. (8)

Or

- (b) (i) Describe the operation of dynamic braking for 3-phase squirrel cage Induction motor. (8)
- (ii) How are loads classified based on their speed – torque characteristic? Explain different characteristics. (8)
13. (a) With the neat diagram explain the operation of four point starter. Also mention the advantages of this over a three point starter. (16)

Or

- (b) (i) Describe the operation of suitable starter for 3-phase slip ring Induction motor. (10)
- (ii) Draw the control circuit for DOL starter. (6)

14. (a) (i) Explain the operation of armature control of a DC shunt motor. (8)  
(ii) Draw and explain the speed control of DC motor using chopper drive. (8)

Or

- (b) (i) With the block diagram explain the operation of armature and field control of DC motor drive using controlled rectifiers. (12)  
(ii) Name the different flux control methods adopted for DC series motor. (4)
15. (a) Explain the operation of different speed control techniques employed for 3-phase squirrel cage induction motor. (16)

Or

- (b) What is meant by slip power recovery scheme? Explain with the necessary diagram. (16)
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