

42842



12. a) i) Explain, with necessary circuit diagram, the reverse current braking and the braking characteristics of the following :
- 1) DC shunt motor. (5)
 - 2) DC series motor. (5)
- ii) A 250 V, DC shunt motor has an armature resistance of 0.05Ω and with rated field excitation has a back emf of 245 V at a speed of 1200 rpm. It is coupled to an overhauling load with a torque of 200 N-m. Determine the lowest speed at which the motor can hold the load by regenerative braking. (6)

(OR)

- b) i) Sketch the speed-torque characteristics of a three phase induction motor and explain its motoring mode, generating mode and braking mode of operation. (8)
- ii) A 15 kW, 415 V, three-phase, 4 pole, 50 Hz induction motor has a speed of 1455 r.p.m. at full load. At this load, the mechanical losses are 600 watt and the stator losses are 750 watt. Find
- 1) Full load slip.
 - 2) Total input power to motor.
 - 3) Current drawn at full load, if the power factor is 0.8 lagging.
 - 4) Net torque developed at output at full load. (8)

13. a) Describe with diagram working of 3-point starter for DC shunt motor. (16)

(OR)

- b) With diagram explain auto transformer starter for three phase induction motor. (16)

14. a) With a diagram explain ward Leonard control system of speed control of D.C. Motor. (16)

(OR)

- b) With a circuit explain speed control strategies of D.C. Motor using first quadrant chopper. (16)

15. a) Explain the static Scherbius drive which provides speeds below and above synchronous speed. (16)

(OR)

- b) Explain the constant torque mode and constant power mode of operation of voltage source inverter fed induction motor drive with necessary diagrams. (16)