

QP Code : 2679

(3 Hours)

Total Marks: 100

- NB:** (1) Question No. 1 is compulsory
 (2) Answer any **FOUR** questions out of the remaining **SIX** questions.
 (3) Assume suitable data if necessary and justify them
 (4) Figure to the right indicates marks
1. (a) Variable frequency control is more efficient than stator voltage control- explain. 4
 (b) What are the main factors which decide the choice of electrical drive for a particular application? 4
 (c) Derive the equivalent value of moment of Inertia of motor load system referred to motor shaft, the load having rotational motion 4
 (d) Explain in brief classes of motor duty 8
 2. (a) Explain what do you mean by steady state stability? And hence derive the condition for steady state stability. 10
 (b) Explain the closed loop speed control scheme which is widely used in electrical drive 10
 3. (a) Explain (with speed torque characteristic in braking and motoring mode) suitable braking method when DC shunt motor is used in hoisting mechanism for lowering loads and also explain DC dynamic braking in DC series motor. 10
 (b) A 230V, 1000 rpm, 105 A separately excited DC motor has an armature resistance of 0.06Ω . Calculate the value of flux as a percent of rated flux for motor speed of 1500 rpm when load is such that the developed motor power is maintained constant at rated value for all speed above rated speed. 10
 4. (a) Explain regenerative braking in three phase induction motor with relevant speed-torque characteristics in braking and motoring mode. 10
 (b) Explain a suitable speed control method for induction motor which is used for fan & pump drive. 10
 5. (a) Explain motoring control and regenerative braking operation of separately excited motor using chopper circuit 10
 (b) A 440V 3-phase, 50-Hz, 6-pole, 945-RPM, Delta connected induction motor has following parameters referred to the-stator
 $R_s = 2\Omega$; $R'_r = 2\Omega$; $X_s = 3\Omega$; $X'_r = 4\Omega$;
 When driving a fan load at rated voltage it runs at rated speed, the motor speed is controlled by stator voltage control. 10

TURN OVER

QP-Con. 11422-15.

Determine

- (i) Motor terminal voltage, current and torque at 800 RPM,
- (ii) Motor speed and current, when terminal voltage is 280 V.

6. (a) What do you mean by load equalization? Explain how moment of inertia of fly-wheel used for load equalization is calculated. 10
- (b) Write a note on brush-less DC drive. 10
7. Write short notes on 20
- a. Stepper motor
 - b. V/f -method of speed control of 3-phase induction motor
 - c. Switch reluctance drive
 - d. Vector control of an induction motor