

## Electrical Drives & Their Control

P. Pages : 2

Time : Three Hours

\*0600\*

**NRT/KS/19/3475**

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.
  8. Due credit will be given to neatness and adequate dimensions.
  9. Assume suitable data whenever necessary.
  10. Use of non programmable calculator is permitted.

- 1.** a) Explain the block diagram of an electric drive. **6**
- b) A 230V, DC Motor drives a load whose torque remains constant. The motor takes a armature current of 25Amp from the supply and its speed is 500rpm. If the speed is to be rise to 700rpm. What additional resistance must be placed in the shunt field winding, if the field resistance and the armature resistance are  $120\Omega$  and  $0.6\Omega$  respectively. **7**

**OR**

- 2.** a) Discuss starting and running characteristics of DC motors. **6**
- b) A 40H.P. , 400V , 3 phase, 50Hz, 6 pole squirrel age induction motor takes a full load current of 58 Amps from the supply and has a slip of 5% The stator is delta connected with the impedance of  $2.5\Omega$ /phase. Calculate the starting torque and starting current taken from the supply if the motor is to be started by-
- i) Direct starting
  - ii) Star-delta & Taster
  - iii) A star connected auto-transformer with 70% Tapping
- 3.** a) Derive the expression for motor torque when load is increasing or flywheel decelerating. **6**
- b) A 25 H.P., 3 phase, 10 poles, 50Hz Induction motor is provided with flywheel has to supply a load curve of 800N-m for 10 sec, followed by no load period during which the flywheel regains, its full load slip of motor is 4% and the torque-speed may be assume linear over the working region. Find the moment of inertia of flywheel if the motor torque is not to exceed the full load torque. **7**

**OR**

- 4.** a) Define- **6**
- i) Continuous rating
  - ii) Short time rating
  - iii) RMS Horse power rating

