

(Following Paper ID and Roll No. to be filled in your Answer Books)

PAPER ID : MC28

Roll No.

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M. TECH. (Sem.II)

THEORY EXAMINATION 2015-16

ADVANCED ELECTRICAL DRIVES

Time: 3 Hours

Total Marks : 100

Note: Attempt any five questions. All questions carry equal marks.

1. (a) Explain concept of electric drive and multi quadrant operation of electric drive.
(b) Explain fundamental torque equation. What are the different criteria to choose electric drives?

2. (a) A 200 V, 200 A, 800 rpm dc separately excited motor has an armature resistance of 0.06Ω . The motor armature is fed from a variable voltage source with an internal resistance of 0.04Ω . Calculate internal voltage of the variable source when the motor is operating in regenerative braking at 80% of the rated motor torque and 600 rpm.
(b) Explain plugging of DC motor.

3. (a) Derive the expression for energy losses during transient operations of a separately excited DC motor.
- (b) A 200 V, 870 rpm, 150 A separately excited dc motor has an armature resistance of 0.05Ω fed from a single phase fully controlled rectifier with an ac source voltage of 220 V, 50 Hz. Assuming continuous conduction, calculate;
- Firing angle for rated motor torque and 750 r.p.m.
 - Motor speed for $\alpha = 160^\circ$ and rated torque
4. (a) Explain any four factor which influences the location of an textile industry.
- (b) Why the textile industry occupies unique position in Indian economy
5. Draw the neat sketch of static Scherbius drive. Explain different schemes based on slip power recovery.
6. Write a brief note on any two of the following:
- Brushless DC motor
 - Switched reluctance motor
 - Chopper control of DC drive

7. A 6 pole, 50 Hz, 3 phase wound induction motor has a flywheel coupled to its shaft, the total moment of inertia of motor load flywheel is 1000 kg-m^2 , load torque is 1000 N-m of 10 sec . Duration followed by a no load period which is long enough for the drive to reach its no load speed. Motor has a slip of 3% at a torque of 500 N-m , Calculate

(i) Maximum torque developed by the motor

(ii) Speed at the end of deceleration period

(Assume that motor speed torque curve to be straight line in the operating range)

8. (a) Enumerate various starting methods for synchronous motor
- (b) Explain hunting phenomenon in synchronous motor.
- (c) Why it is not self starting.
- (d) Draw the neat sketch of cycloconverter scheme for speed control of synchronous motor.
