MEPS–302(C)

M. E. (Third Semester) EXAMINATION, Dec., 2010

ADVANCED ELECTRICAL DRIVES

(Elective – V)

[MEPS – 302(C)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

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

1. (a) Discuss in detail the different components of Electric drive. 10

   (b) Explain the Multiquadrant operation of Electric drives, emphasising on speedtorque conventions. 10

2. (a) Discuss the speed-torque characteristics of D. C. shunt motor and compare it with a D. C. series motor. 10

   (b) A 200 V, 10·5 A, 2000 r. p. m. shunt motor has the armature and field resistance of 0·5 and 400 Ω respectively. It drives a load whose torque is constant at rated motor torque. Calculate motor speed if the source voltage drops to 175 V. 10

3. (a) Explain the operation of a single phase fully controlled rectifier fed D. C. seperately excited motor with relevant mathematical expression and characteristics. 12

   (b) Explain Chopper controlled D. C. drives. 8

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4. (a) Explain the operation of 3-phase induction motor with unbalanced source voltage. 10

   (b) Discuss the different methods employed for braking of an induction motor. 10

5. (a) Explain variable frequency control method of speed control for a three phase induction motor drive. 10

   (b) What are the different starting methods of a single phase induction motor ? 10

6. (a) Discuss the operation of Hysteresis synchronous motor. 10

   (b) Explain different modes of variable frequency control of synchronous motor drive. 10

7. (a) Compare single stack and multistack variable reluctance stepper motor. 10

   (b) Explain the operation of switched reluctance motor with relevant expressions and characteristics. 10

8. Write short notes on any *three* of the following : 20

   (i) Traction drives

   (ii) Selection of motor power rating

   (iii) Closed loop control of D. C. drive

   (iv) Starting methods of 3-phase induction motor

   (v) Energy conservation in Electric drives