7/5/13

B.E. DEGREE EXAMINATION APRIL/MAY 2013
SEVENTH SEMESTER
EE9401-SOLID STATE DRIVES
(REGULATION 2008)

TIME:3 HRS **MAXIMUM:100 MARKS**

PART A (10 X 2 =20 MARKS)

1. Draw the load torque characteristics for fan type of load and traction load.
2. What are the different components of load torque?
3. Differentiate between active load torque and passive load torque.
4. Explain current limit control operation of chopper fed drive.
5. Explain constant HP mode of operation of induction motor drive with v/f control.
6. What are the disadvantages of VSI fed over CSI fed induction motor?
7. What are the advantages of permanent magnet synchronous motor ?
8. What are the different types of controllers used for closed loop speed control?
9. Which converter is preferred full converter or semiconverter when the motor is subjected to regenerative braking?
10. What is the advantage of leading powerfactor operation for synchronous motor drive.

PART B (5X 16 MARKS)

11. i)Explain the four quadrants of operation of a drive (8)
    ii) What is steady state stability of a drive?Derive the condition of steady state stability of a drive. (8)

12.a.(i) Explain the operation of semiconverter fed separately excited dc motor in continuous mode of operation with waveforms. Derive the speed torque expression and draw the N-T characteristics for different α . (12)
(ii) What is the effect of discontinuous conduction in converter fed drives? (4)

(OR)

12.b.Explain the four quadrant operation of Class E chopper fed separately excited dc motor with N-T characteristics and V-I characteristics

13.a.(i) Derive the transfer function of converter fed motor-load . (10)
(ii) What is the need of current and speed feedback? (6)

(OR)

13.b. Explain with block diagram the closed loop control of separately excited dc motor with current limiting and inner current control.

14.a.Explain stator voltage control of induction motor drive with N-T characteristics. Explain why this method is best suited for pump drives.

(OR)

14.b. Explain constant airgap flux control of induction motor drive with characteristics

15.a.i)Explain the margin angle control of synchronous motor drive. (10)

ii)Why a self controlled synchronous motor is free from hunting oscillations? (6)

(OR)

15.b. Explain V/f control of synchronous motor drive.