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Code No: 52201/MT

M.Tech. – II Semester Regular Examinations, September, 2008

POWER ELECTRONIC CONTROL AC DRIVES

(Common to Power Electronics & Electric Drives/ Power & Industrial Drives/ Power Electronics)

Time: 3hours **Max. Marks:60**

Answer any FIVE questions
All questions carry equal marks

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1.a) Explain torque production in an induction motor.
b) Explain induction motor characteristics in constant torque and field weakening regions.

2. Explain the operation of three-phase voltage source inverter fed three phase induction motor drive with 120^0 conduction with the help of circuit diagram and waveforms. Also sketch speed-torque characteristics for sub-synchronous speeds.

3. A 3-phase, 400V, delta connected induction motor has the following parameters at 50Hz. R_s=0.5 Ω, R_r=1.5 Ω, X_s= X_r=2.5 Ω, X_m=130 Ω. This motor is fed from a square wave inverter. The voltage waveform is such that its fundamental is equal to the rated voltage of the motor. Determine the input current corresponding to a rotor frequency of 3Hz. When stator frequency is 50 Hz and 20 Hz and voltage applied is proportional to frequency.

4.a) Draw and explain a closed loop operation for a static Kramer controlled drive, with its speed-torque characteristics.
b) In which way a static Kramer control is different from static scheribus drive.

5. Discuss the CSI method of speed-control of synchronous motor and describe the operation of the converter with waveforms.

6. Explain the operation of induction motor drive when indirect vector control is adopted, with neat block diagrams.

7. Explain the basic principle of variable relevetance motor and discuss the torque production.

8. Discuss the working of a three phase current controlled Brushless DC motor drive.

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