Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MEPE-201

M.E./M.Tech. II Semester

Examination, December 2017

Solid State Controllers of Drives

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) Each question carries equal marks.

1. a) Draw circuits of 7
   i) Single phase semi-controlled rectifier.
   ii) Three-phase semi controlled half wave.
   b) Draw circuits of type A, B, C, D, E and multiphase choppers. 7

2. a) Discuss using a block diagram a scheme used for developing firing scheme for a single phase half controlled rectifier. 7
   b) Explain the working principle of sine PWM using single phase half bridge inverter. 7

3. a) Distinguish between scalar control and field oriented control of induction motor drive also explain sensorless control. 7
   b) Explain microprocessor based control of a current source inverter fed synchronous motor. 7

4. a) Describe CSI fed and VSI fed synchronous motor drives in details with block diagram and compare them. 7
   b) Discuss the operation of a chopper fed D.C. drive for motoring and regenerative breaking mode operation. 7

5. a) Describe direct torque control scheme used for induction motor drive. 7
   b) Explain variable stator, voltage control of induction machines and discuss its applicability. 7

6. a) Explain control scheme for switch reluctance motor. 7
   b) Explain control scheme for permanent magnet brushless A.C. motor drives. 7

7. a) List the advantages of micro-processor controlled drives. Explain how a microprocessor must interface with power electronics control to make a drive system. 7
   b) Discuss in detail self control mode of control of a synchronous motor drive. 7

8. Write short notes (Any two) 14
   a) Transient analysis of a three phase I.M. during starting dynamics.
   b) Power quality improvement in A.C. drives
   c) Application of PLL
   d) D.C. link Static Scherbius drive

604

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