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

Roll No .....

EX-702 (GS)

B.E. VII Semester

Examination, December 2017

Grading System (GS)

Electrical Drives

Time : Three Hours

Maximum Marks : 70

Note: i) Answer any five questions.
ii) All questions carry equal marks.
iii) Assume any missing data, if any.

1. A single phase full converter bridge is connected to RLE load. The source voltage is 230V, 50Hz. The average load current of 10 Amp is continuous over the working range. For R = 0.5Ω and 2.5mH, calculate: 14
   i) Firing angle delay for E = 120V
   ii) Firing angle delay for E = –120V
   Show that which source is supplying power to load in (i) and (ii).
   The output waveforms of voltage and load current for both (i) and (ii) cases.

2. Give the power circuit for a three phase semi-converter supplying RLE load. Draw the waveforms of voltage and current for different firing angles.
   Obtain the expression of average output voltage for the above. 14

3. a) Explain the working principle and operation of single phase, circulating current type - dual converter, also draw its output waveforms. 7
   b) Describe the four quadrant chopper fed d.c. separately excited motor with the help of diagrams. 7

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4. a) Explain the Regenerative and dynamic braking of a separately excited motor. Also draw the speed torque characteristics in brief. 6
   b) A 220V, 970 rpm, 90 Amp. d.c. separately excited motor has an armature resistance of 0.05 ohms. It is braked by plugging from an initial speed of 1000 rpm. 8
   Calculate :
   i) Resistance to be placed in armature circuit to limit braking current to twice the full load value.
   ii) Braking torque and
   iii) Torque when the speed fallen to zero.

5. Discuss the VSI fed induction motor drive on following: 14
   i) Circuit of transistor fed induction motor
   ii) Waveform of line voltage in stepped shape
   iii) Output voltage expression (derivation)

6. Write a short notes on the following:
   a) Static Kramer drive 7
   b) Slip power recovery static scherbius drive 7

7. a) Draw and explain the circuit diagram in brief for load commutated CSI fed synchronous motor. 7
   b) Draw the block diagram of closed loop operation of a synchronous motor drive and explain it in brief. 7

8. Write short notes on any two of the following: 7, 7
   a) Differentiate between True and Self controlled mode of operation of synchronous motor drive.
   b) Static rotor resistance control of Induction motor drive.
   c) Control of induction motor by cyclo converter.
   d) Closed loop operation of D.C. motor (block diagram)
   e) Closed loop operation of Induction motor drives (block diagram).

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