Exam.Code:0937
Sub. Code: 6773

2074

B.E. (Electrical and Electronics Engineering)

Seventh Semester

EE-710: Power Electronic and Drives

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part. Assume suitably missing data, if any.

x-x-x

x-x-x

1.	a.	Name the practical gating signal for an AC voltage controller. Also give its advantages.	(2)
	b.	Write the expressions of output voltage, v_o for a complete cycle for a half-bridge inverter.	(2)
	c.	Write the electro-dynamic equation of a drive system in differential form.	(2)
	d.	Write the relationship between output frequency, input frequency and reduction factor for a three-phase to single-phase cycloconverter.	(2)
	e.	By which method the torque can be kept maximum in all the speed range of induction machine drive system?	(2)

Part-A

2. a. Draw the output voltage and current wave-shapes for single-phase full-wave AC voltage controller feeding a resistive load. **(4)**

b. A single-phase full-wave ac voltage controller feeds a resistive load of R=20 ohms with an input voltage of 230 V, 50 Hz. Firing angle for both the thyristors is 45 degrees. Find **(2,4)**

(a) *rms* value of output voltage
(b) load power and input power-factor.

3. A three-phase bridge inverter delivers power to a resistive load from a 450 V dc source. For a star-connected load of 10 ohms/phase, determine **(5,5)**

(a) rms value of load current
(b) rms value of thyristor current

for 180 degree mode operation of this inverter.

4. Explain the operating principles of:

a. Single-phase half-bridge inverter. **(5)**

b. Single-phase half-wave ac voltage controller. **(5)**

P.T.O.

Part-B

5. Explain the working of single-phase to single-phase circuit step-down cycloconverter with discontinuous load current. **(10)**

6. a. Explain the working of 3-phase full-converter feeding a separately excited dc motor with voltage, v_t and current waveforms, i_a, i_A and i_{T1} for firing angle of 30 degrees. **(8)**

b. Also, write the expression for average output terminal voltage, v_t of the armature circuit. **(2)**

7. Write short notes on the following:

a. Stator voltage control of Induction motor drive system. **(5)**

b. Operation of two-quadrant chopper drive. **(5)**

x-x-x