Exam.Code:0937
Sub. Code: 6991

1129

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 Unit.

x-x-x

I. Attempt the following:-

a) What is meant by inverter? What are the applications of an inverter?

b) What is the duty cycle in ON-OFF control method?

c) What type of gating signal is used in single phase ac voltage controller with RL load?

d) What are the applications of cycloconverters?

e) Define stator voltage and stator frequency. (5x2)

UNIT – I

II. a) Explain the operation of a three phase bidirectional delta connected controller with neat circuit diagram and necessary waveforms.

b) The full wave three phase controlled rectifier has a three phase 415V, 50 Hz source (240V phase), and provides a 100 A constant load current. Determine:
i) The average and rms thyristor current
ii) The rms and fundamental line current
iii) The fundamental apparent power (2x5)

III. a) Describe the principle of operation of three phase bridge inverter operating in 180° conduction mode with necessary diagrams.

b) Explain in detail the sinusoidal pulse width modulation technique used in inverters. (6,4)

IV. a) Explain in detail the cascaded H-bridge topology of a multilevel inverter. Mention some advantages of cascaded H-bridge topology.

b) What are the differences between voltage source inverters and current source inverters? (6,4)

P.T.O.

UNIT – II

V. a) Discuss the operation of three phase to single phase cycloconverter with neat circuit diagrams and waveforms.

b) Briefly explain the operation of a dual converter. (6,4)

VI. a) Develop a criterion for finding the steady state stability of an electric drive.

b) A 230V separately excited DC motor takes 50 A at a speed of 800rpm. It has armature resistance of 0.4 Ω. This motor is controlled by type C chopper with an input voltage of 230 V and frequency of 800 Hz. Assuming the continuous conduction mode, calculate speed of regenerative braking operation at duty ratios of 0.7 and 0.4. (2x5)

VII. a) With relevant diagrams, explain the operation of two quadrant and four quadrant chopper drives.

b) Write the applications of DC and AC drives. (6,4)

x-x-x