Roll No.									

B.E. / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2011

Electronics and Communication Engineering Branch

SEVENTH SEMESTER

EC 9047 – POWER ELECTRONICS

49

(REGULATIONS 2008)

Time: 3 Hours Max. Marks:100

Answer All Questions

Part-A (10 x 2 = 20 Marks)

1) State the purpose of di/dt protection.
2) Give the symbol and characteristics of N-channel MOSFET.
3) Define line synchronization.
4) List the uses of AC voltage regulators.
5) Enumerate the demerits of a linear power supply when compared to SMPS.
6) What is a switching mode regulator?
7) List the advantages of a variable frequency chopper?
8) Give the methods for voltage control within the inverters?
9) What is an electrical time constant of dc motor?
10) List the advantages of micro-electronic relays.

Part-B (5 x 16 = 80 Marks)

11.

(a)

(i) A diode circuit with an *LC* load has a Capacitor having an initial voltage, V_o = 110V, Capacitance C= 10μF, and an Inductance L = 40μH. If switch S_1 is closed at t = 0, determine (a) Peak Current through the diode. (b) The conduction time of the diode, and the steady-state capacitor Voltage. (10)

(ii) Write short notes about the power Triac and power MOSFET. (6)

12)

(a) Describe the working of a three phase full converter in the rectifier with RL load and derive the expression for the average output voltage in terms source voltage and firing angle. (16)

(or)

(b) With neat diagram, explain the operation of AC voltage controllers. (16)

13.

(a) With the help of circuit diagram and output voltage waveforms, explain the principle of operation of a chopper. (16)

(or)

(b) Describe the principle operation of a Buck-Boost Regulators. Derive an expression for its average dc output voltage. (16)

14)

(a) Describe in detail, the principle, operation of a pulse width modulated inverters. (16)

(or)

(b) With the help of neat circuit diagram and associated waveforms, explain the operation of single phase full bridge inverter with resistive load. (16)

15.

(a) Draw the circuit diagram and explain a speed control scheme for a three phase induction motor and explain its operation. (16)

(or)

(b) Write short notes about the following items:-

(i) Solid state relays (8)

(ii) Micro-electronic relays (8)