B.E. / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2014

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

SEVENTH SEMESTER

EC 511 / EC 9047 – POWER ELECTRONICS

(REGULATIONS 2008)

Time: 3 Hours Max. Marks:100

Answer All Questions

PART-A (10x2=20)

1. Compare the characteristics of SCR with that of power transistor.
2. Define the function of protection and driver circuits.
3. Why we need three phase controlled rectifiers?
4. List out the practical applications of AC voltage controllers.
5. Enumerate the features of a variable frequency chopper.
6. What is meant by bidirectional power supplies?
7. Give the methods for voltage control, within the inverters?
8. Draw the block diagram of improved series inverter circuit.
9. Differentiate induction and sychronours motor drives.
10. What is the use of relays in systems?

PART-B (5x16=80)

11 (i) Explain the circuit arrangements that are necessary for proper operation of series connected thyristors. (10)

(ii) Explain how a power MOSFET is turned-on and turned-off. (6)

12 (a) Explain the operation of any one of the three phase cyclo converters. Draw and explain the trigger circuit of the cyclo converters. (16)

OR

(b) Describe with neat diagram about AC voltage controllers. (16)

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

OR

(b) Write short notes on

(i) Switched mode power supply

(ii) Resonant power supply

(iii) Bidirectional power supply. (16)

14. (a) With the necessary explanation and equations, write the notes on following items:-

(i) Voltage source invertors (8)

(ii) Current source invertors (8)

OR

(b) With necessary block diagram explain the operation of single phase and multi phase PWM inverters. (16)

15.(a) Discuss the operation of HVDC system and explain how the power flow can be easily controlled in both directions and also elaborate its merits. (16)

OR

(b) Explain the principle of brushless motor drives. List the advantages of solid state relay based DC drive. (16)