SIXTH SEMESTER B TECH DEGREE EXAMINATION JUNE 2009
EC 04 605 POWER ELECTRONICS

Time: 3 hours   <u>PART- A</u>   Maximum: 100 marks

(Answer all questions)

1.

(a) What are the various methods to turn –on an SCR ?

(b) Draw and explain UJT trigger circuit for an SCR?

(c) Explain multiple PWM technique used in inverters?

(d) Explain the difference between a half controlled bridge and fully controlled bridge?

(e) Explain the advantages of thyristorised methods of speed control of motors over the conventional methods?

(f) Differentiate AC Regulators from Regulators?

(g) Briefly explain the working of a CUK Regulator?

(h) With the help of a block diagram explain the working of SMPS?

(8 X 5 = 40 marks)

2.

(a) (i) Give a comparison of the power semiconductor devices BJT, power MOSFET and IGBT in terms of their structure and V-I Characteristics?
(10 marks)

(ii) Explain auxiliary commutation scheme for SCR's?   (5 marks)

OR

(b) (i) Explain the constructional details and operation of a TRIAC with static characteristics. What are different modes of operation?   (10 marks)

(ii) What are the various voltage rating of SCRs?   (5 marks)

3.   (a) (i) Explain, with necessary waveforms, the operation of a half controlled bridge rectifier feeding RI load?   (10 marks)

(ii) Explain the function of a Free-wheeling diode, showing how it is connected in a circuit?   (5 marks)

OR

(b) Explain the working of a single phase parallel inverter. Bring out its salient features and limitations? (15 marks)

4.   (a) (i) Explain the basic principle of operation of a cycloconverter (8 marks)

(ii) Explain Slip power recovery scheme ? (7 marks)

OR

(b) (i) What are choppers? Explain the different types of Choppers in detail? (8marks)

(ii) Explain how the speed of a DC Motor can be controller using thyristors? (7 marks)

5.   a) (i) Explain Online and Off line UPS with the help of Block Diagrams? (10 marks)

(ii) What are the applications of SMPS? (5 marks)

OR

b) (i) Explain the working of a Boost converter with the help of necessary Diagrams? (10 marks)

(ii) Derive the expression for output voltage of a buck regulator? (5 marks)

(4 X 15 = 60 marks)

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