

2054

B.E. (Electrical and Electronics Engineering)

Sixth Semester

EE-606: Power Electronics ✓

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) Draw a neat diagram of two transistor model of an SCR.
- b) Draw symbols of MOSFET and IGBT.
- c) Explain how the performance of a phase controlled rectifier get affected in the presence of source inductance.
- d) Draw a neat circuit diagram of a step-up chopper.
- e) What do you mean by the current commutated chopper? (5x2)

UNIT - I

- II. With the help of neat circuit diagrams discuss different turn on methods of a thyristor. (10)
- III. Calculate the number of SCRs of ratings 800V and 200A required for a string to handle 5kV and 1300A for a derating factor of 0.4. (10)
- IV. What are different thyristor commutation techniques? Explain class D commutation technique in details. (10)

UNIT - II

- V. Draw a neat circuit diagram of a 1-phase dual converter; explain circulating and non-circulating current operation with the help of relevant waveforms. (10)
- VI. A boost regulator has an input voltage of 10V. The required average output voltage is 30V at average load current of 0.5A. The switching frequency is 20 kHz. If the values of passive components are 150 μ H and 220 μ F, determine (a) duty cycle and (b) the critical values of passive components. (10)
- VII. Write short notes on:
 - a) Working of a single-phase full converter.
 - b) Cuk regulator. (10)

x-x-x