Exam.Code:0936
Sub. Code: 33782

2015

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:-

(i) Differentiate the latching current and holding current of an SCR with the help of its V-I plot.

(ii) What is basic difference between natural and forced commutation of an SCR?

(iii) Explain the role of a freewheeling diode in a phase controlled rectifier.

(iv) Draw a neat circuit diagram of a single-phase dual converter.

(v) Write input-output voltage relation for a step-up chopper and comment on the output voltage value for unity duty ratio. (5x2)

UNIT - I

II. Explain the working of an SCR using two-transistor equivalent circuit. (10)

III. Discuss any one forced commutation technique with the help of a neat circuit diagram and relevant waveforms. (10)

IV. SCRs with ratings of 1250V and 200A are used in a string to handle 5.5kV and 550A. Calculate the number of series and parallel units required if derating factor is 0.4. (10)

UNIT - II

V. With the help of a neat circuit diagram and relevant waveforms, explain the working of a 3-phase full converter for R-L Load. (10)

VI. First quadrant dc-dc converter is feeding an R-L load with following data: Source voltage = 230V, R = 4 ohm, L = 7.0mH, f = 2kHz, duty cycle = 0.5.

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Calculate (a) the minimum instantaneous load current, (b) the peak instantaneous load current, (c) the maximum peak-to-peak load ripple current, and (d) the average value of load current. (10)

VII. Write short notes on:

(i) Single-phase half converter.

(ii) Voltage commutated chopper. (10)

x-x-x