

06/05/2016

6E6074

Roll No. _____

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6E6074

B. Tech. VI-Sem. (Main/Back) Exam., April/May-2016
Electrical & Electronics Engineering
6EX4A Advanced Power Electronics
Common with EE, EX

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks (Main & Back): 26

Instructions to Candidates:-

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly.

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

UNIT-I

- Q.1 (a) Explain the operation of single phase AC voltage controller with R load. What changes will take place in output voltage? [8]
- (b) A three phase, 3 wire bidirectional controller supplies a star connected R load of $R = 5\Omega$ and line to line voltage of 210V (RMS) at 50 Hz. The firing angle $\alpha = \pi/2$. Determine: [8]
- (i) RMS output phase voltage E_o
 - (ii) Input power factor P. f.
 - (iii) Expression for instantaneous output voltage of phase 'A'

OR

- Q.1 (a) Explain the working principle of three phase full wave controller. [8]
- (b) A single phase voltage controller has input voltage of 230V, 50Hz and a load of $R = 16\Omega$ for cycle off. Determine - [8]
- (i) RMS output voltage.
 - (ii) Input power factor.
 - (iii) RMS thyristor current.

UNIT-II

- Q.2 (a) Describe three phase to three phase cyclo converter with relevant circuit arrangement using 18 SCRs. [8]
- (b) Explain the working principle of control circuit of three phase cyclo converter. [8]

OR

- Q.2 (a) Explain the operation of three phase to single phase cycle converters. [6]
- (b) A 3- ϕ cycle converter feeds a 1- ϕ load of 190V, 45A at power factor of 0.7 (lagging). Determine - [10]
- (i) The required supply voltage.
 - (ii) Thyristor rating, and
 - (iii) Power factor of supply current.

SM-11

Q.3 (a) Explain 120° mode of operation of VLC. Compare VLC and SCR with respect to

Advantages and demerits.

(b) A capacitor commutated $L-\phi$ bridge in

load of 5Ω . Thyristor

(i) SCR

(ii) Load

OR

- Q.4 (a) Explain the M type ZCS resonant. [8]
- (b) Explain working principle of ZVS resonant converter in detail. [8]

UNIT-V

- Q.5 (a) Discuss the comparative analysis of fly back and forward converter in detail. [8]
- (b) Discuss the operation of bidirectional AC power supply. [8]

OR

- Q.5 (a) What is the conditioning of power factor? Discuss multistage converter used for conditioning of power factor . [10]
- (b) Explain the resonant AC power supplies. [6]
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