

TE - sem - V - Electrical

P.E.

(old)

4/6/15

QP Code : 3741

(OLD COURSE)

(3 Hours)

[Total Marks : 100

- N. B. : (1) Question No. 1 is compulsory.
(2) Answer any four from remaining six.
(3) Figures to the right indicate marks.
(4) Assume suitable data if necessary.

1. Draw and explain single phase fully controlled bridge converter with R-L load with all the related wave terms for $\alpha = 90^\circ$. Derive the average and RMS values of load voltage. Is it possible to have constant ripple free current, if yes explain how. 10
2. (a) Explain static and dynamic characteristic of SCR. 10
(b) Draw and explain single phase cyclo-converter with relevant waveforms. 10
3. (a) Explain with circuit diagram and waveforms the buck-boost regulators. 10
(b) A Boost regulator has an input voltage of 10v. The average o/p voltage is 15v and load current is 0.4 Amps. The chopping frequency is 20 kHz. Assume inductor as 100 μ H. Calculate the duty ratio and ripple current of inductor. 10
4. (a) Compare Natural and forced commutation. Explain any two commutation techniques in detail. 10
(b) Draw and explain circuit diagram for single phase AC regulator with wavegrams. 10
5. (a) Explain gate-triggering techniques. 10
(b) Draw three-phase inverter circuit. Explain the functioning of same with 180° mode of conduction. Draw waveforms. 10
6. (a) Explain PWM technique to control the output voltage of single phase inverter. 10
(b) What do you mean by power MOSFET. Explain its operation characteristics and application. 20
7. Write short notes on any three :-
 - (a) Protection of SCR
 - (b) Diac and Triac combination for any application
 - (c) 3ϕ full converter with R load.
 - (d) Single phase dual converter.

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