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EX - 504
B.E. V Semester
Examination, December 2012
Power Electronics Devices and Circuits

Time : Three Hours

Maximum Marks : 70/100

Note : 1. Attempt one question from each unit.
2. Total five question must be attempt.
3. Each question carry equal marks.

Unit - I

1. a) Describe various methods of triggering of the thyristor.
   b) Explain main features of firing circuit.

OR

2. a) Give the merits and demerits of GTO, as compared to conventional thyristors.
   b) What is commutation? Explain class-D commutation.

Unit - II

3. a) Explain the operation principle of 3 φ full. Converters with associated waveforms.
   b) Explain the effect of source impedance on the performance of 3 φ converters.

OR

4. a) Draw circuit diagram of a single phase dual converter and explain its working for both the modes of operation.

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b) A single phase half wave circuit is fed by 240 V rms ac supply. Assume that load current is continuous and voltage drop across the thyristor when on is 1.5 V. Find average load voltage for firing angle of $0°$, $30°$.

Unit - III

5. a) Draw a diagram and discuss the operation of a series inverter. Derive an equation for this circuit.
   b) What is sinusoidal pulse width modulation? How is it obtained? Explain with the help of neat diagram.

OR

6. Draw the diagram of a 3 pulse bridge inverter circuit and explain its working. What are the two modes of operation?

Unit - IV

7. a) Discuss the methods of controlling the output voltage of a chopper.
   b) Explain the voltage commutated. Chopper with neat diagrams & waveforms.

OR

8. Describe different types of chopper circuit with relevant diagrams.

Unit - V

9. a) Among two types of AC voltage controllers which one is preferred and why?
   b) Explain cycloconverter operation with neat circuit diagram and waveforms.

OR

10. Draw the circuit diagram of a 3 phase to 1 phase bridge type cycloconverter and explain its working. Are all the thyristors in cycloconverter gated simultaneously?

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