Total No. of Questions :5] *[Total No. of Printed Pages :2*

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EX - 504

B.E. V Semester

Examination, December 2013

Power Electronics Devices and Circuits

Time : Three Hours

Maximum Marks : 70

Note: Attempt any five questions. All questions carry equal marks

Unit - I

1. a) Explain the two transistor analogy of a thyristor with the help of diagram. 7
   b) Write a short notes on the following:- 7
   i) LASCR ii) Schottey diode

OR

   a) Give the Design of Snubber circuit and obtain the values of various parameters. 7
   b) Describe various commutation techniques for SCR in brief with circuit diagram. 7

Unit - II

2. a) Give critical comparison of mid point and bridge rectifier circuit with diagram. 7
   b) A single-phase 230V, 2kW heater is connected across single phase 230V, 50Hz A.C supply through a diode calculate the power delivered to the heater element. Find also the peak diode current and input power factor. 7

OR

Describe the single phase half wave diode rectifier with resistive inductive load with circuit diagram and draw output waveforms.

How performance can be improved by connecting a freewheeling diode across the load show by the wave forms of the above configuration. 14

Unit - III

3. a) Describe the basic principle of operation of single phase full bridge inverter with circuit diagram and draw its waveforms. 7
   b) Explain the various methods for the control of output voltage of single phase inverter in brief. 7

OR

   a) Explain in brief the various techniques to reduction of harmonics in the inverter output voltage. 7
   b) Describe the circuit of a three phase bridge inverter using six thyristors and six diodes and draw the voltage waveforms for 180° mode of 3-phase VSI. 7

Unit - IV

4. a) Explain Jone's chopper with circuit diagram and give its field of applications. 7
   b) A type-A chopper operating at 2.5KHz from a 120V d.c source has a load time constant of 5ms and load resistance of 12Ω.
   Find the mean load current and the magnitude of current ripple for a mean load voltage of 60V. Also calculate the minimum and maximum values of current. 7

OR

   a) Describe the working principle of a step up Chopper with circuit diagram and draw its output waveforms.
   Show that the step up chopper can be used for the regenerative braking of d.c. motor. 7
   b) Explain the working operation with circuit diagram of morgan's chopper. 7

Unit - V

5. a) Draw and explain the block diagram of switched mode voltage regulator. 7
   b) Explain the single phase voltage controller with RL load with circuit diagram and its output waveforms. 7

OR

   a) Give the diagram of bridge type single phase to single phase cycloconverter and explain in brief the operating principle of the above configuration. 7
   b) Explain cuk regulator for the voltage control with circuit diagram and obtain the expression and draw its output waveforms. 7

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