

- c) How can the output frequency of a cycloconverter be changed?
- d) Explain the working of a single phase bridge type cycloconverter using a simple diagram. Draw the input wave of frequency f and output wave of frequency $f/2$ for a resistance load.

OR

Explain in detail the operation of dual converter with circulating current.

Roll No .

EX-504**B.E. V Semester**

Examination, June 2016

Power Electronics Devices and Circuits*Time : Three Hours**Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
- ii) All parts of each question are to be attempted at one place.
- iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
- iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) What is snubber circuit?
- b) Explain the dv/dt triggering.
- c) Draw and explain the V-I characteristic of SCR.
- d) Explain the working of UJT firing circuit.

OR

What is commutation? Explain class B commutation with the help of circuit diagram and waveform.

Unit - II

2. a) What is the difference between single phase semiconverter and full converter if the load is purely resistive?
- b) Why is freewheeling diode used in rectifier circuits?
- c) What's the difference between semiconverter and fully controlled converter?
- d) For a 3-phase semiconverter, draw output voltage waveforms for a firing angle delay of 45° . Indicating the conduction of its various elements on the assumption of continuous output current.

OR

Describe the effect of source inductance on the performance of a 3-phase full converter with the help of phase voltage waveforms. Indicate the sequence of conduction of various thyristors and sketch load current waveforms for both positive and negative group of thyristors.

Unit - III

3. a) Discuss the classification of inverter.
- b) Why should a current source inverter have a large inductance in series with the source?
- c) What is the difference between single phase half bridge and full bridge circuits?

- d) Discuss the working of a three phase bridge inverter operating as a 180° conduction mode.

OR

Explain the principle of operation of McMurray-Bedford inverters.

Unit - IV

4. a) Why does a chopper need forced commutation?
- b) What quantity is varied in PWM and frequency modulation?
- c) With the help of circuit diagram. Explain the working of step down chopper.
- d) Draw the circuit diagram of type E chopper and explain its working principle.

OR

Draw the circuit of Morgan chopper and explain its working. Draw waveforms of different currents and voltages.

Unit - V

5. a) Define duty cycle of an integral control regulator.
- b) In integral cycle control, why is power factor very poor for low values of duty cycle.