

**MENOUFIA UNIVERSITY
FACULTY OF ENGINEERING
ELECTRICAL ENGINEERING D.P.T.
POWER ELECTRONIC DEPLOM EXAM
3 Hours 13 – 1 – 2014**

Answer the following questions.

Question (1)

The full controlled converter given in figure (1) is connected to 120 volt 60Hz single phase supply. The converter loading circuit are R-L-E with $R=2.5$ ohm, $L=6.5$ m H and $E=-10$ volt:-

Explain with the aid of waveform the circuit basic principle of operation.

Drive the mathematical expression for the load voltage, current and power.

Calculate the converter ripple factor and form factor.

25 mark

Question (2)

Design the digital controller that required generating the controlling signals that required satisfying the converter operation including the interfacing circuit.

25 mark

Question (3)

Figure (2) illustrate a dual converter which operated from a single phase supply of 120 volt, 60 Hz. If the converter supplies a resistive load of $R=10$ ohm and circulating inductance $L=40$ m H. If the rectifier part firing angle is 60 degree, what will be the controlling angle for the inverter part., explain why

Explain with the aid of waveform the converter basic principle of operation. Calculate the load current passing through the load.

25 mark

Question (4)

Design with the aid of circuit diagram the firing circuit that required that satisfy the converter operation at this firing angle.

25 mark

NOTE: Assume any required data.

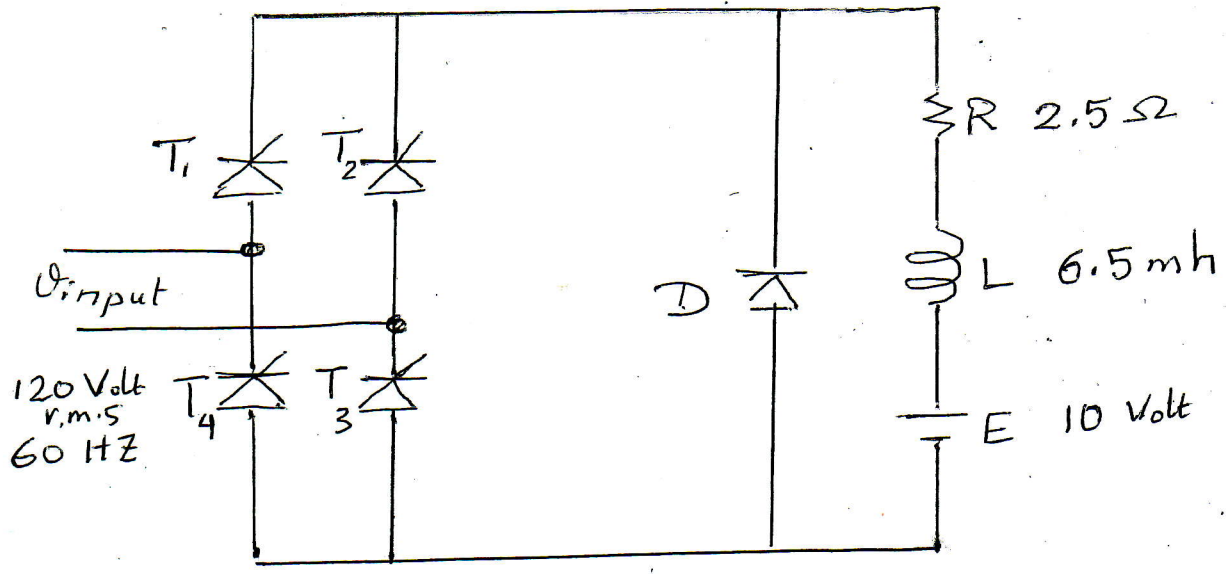


Figure (1)

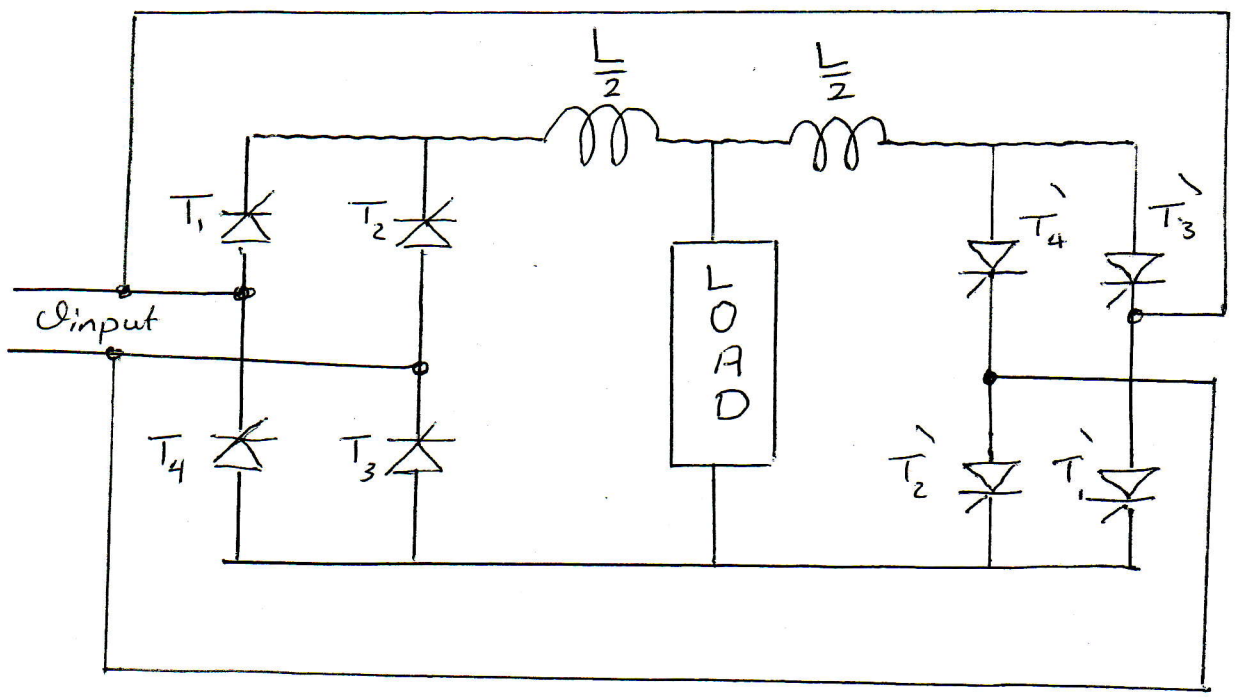


Figure (2)