



Subject/Code: Power Electronics Systems/ ELE 519
This exam measures ILO's no. (A1, A3, A5, B1, B2, B3, C3, C4)
Remarks: No. of pages: 2 No. of questions: 5
Allowed Tables and Charts: (None)

Answer All The Following Questions:

The First Question:

[20- Marks]

- 1) What are the advantages of a three phase rectifier over a single phase rectifier? Show your answer with a simple drawing
- 2) What is the purpose of filter in rectifiers circuits?, What is the difference between ac and dc filter?
- 3) What is the difference between centre-tap and bridge in single phase rectifier? Show your answer with a simple drawing
- 4) Mention some applications of ac to dc rectifier.
- 5) What are the differences between load side and line side commutation?

The Second Question:

[20- Marks]

- 1) What is the difference between diode rectifier and controlled rectifier?
- 2) Explain how a three semi converter operates, draw its circuit and its waveforms?
- 3) What is the function of the freewheeling diode in single-phase semi converter ?
- 4) What is the principle of phase control for controlled rectifier?
- 5) What are the differences between ac and dc switches?

The Third Question:

[20- Marks]

- 1) List the main types of chopper and discuss the principle of operation of them.
- 2) What is the steps involved in the design of the DC chopper
- 3) What are the types of switching regulators and explain each type mode of operation?
- 4) What are the advantages and disadvantages of buck and boost regulators ?

The Fourth Question:

[20- Marks]

- 1) Define AC voltage controller? write some applications of them.
- 2) List the main types of AC voltage controller? What are the disadvantages of AC voltage controller?
- 3) Explain the principle of the on-off control and Phase control for AC voltage controller?
- 4) Discuss briefly the cycloconverter ?
- 5) Show the operation of reversing in three-phase AC switches and draw the reversing circuit?

The Fifth Question:

[20- Marks]

- 1) Mention the different applications of inverter in practice?
- 2) What is the main method for voltage control within the inverter? Explain two techniques.
- 3) What are the advantages and disadvantages of harmonic elimination technique?
- 4) What are the normal specifications of power supplies?
- 5) Mention the types of DC power supplies and discuss one of them
- 6) Sketch the power circuit of switched mode AC power supply?

With the best wishes
Prof. Dr. Elwy E. El-kholy