



Subject/Code: **Power Electronics Systems/ ELE 610**

This exam measures ILO's no. (A1, A3, A5, B1, B2, B3, C3, C4)

Remarks: No. of pages: 1 No. of questions: 4

Allowed Tables and Charts: (None)

Answer All The Following Questions:

The First Question (20- Marks)

- What is a rectifier?
- What are the advantages of a three phase rectifier over a single phase rectifier? Show your answer with a simple drawing
- What is the difference between center-tap and bridge in single phase rectifier? Show your answer with a simple drawing
- Mention some applications of ac to dc rectifier.

The Second Question (20- Marks)

- What is a controlled rectifier?
- What is the principle of phase control for controlled rectifier?
- What is the difference between diode rectifier and controlled rectifier?
- Mention the advantages of controlled rectifier and some application of it, then Compare between types of single phase converter; Show your answer with a simple drawing.

The Third Question (20- Marks):

- What is a DC chopper? Mention its applications
- List the main types of chopper and discuss the principle of operation of them.
- Compare between the chopper control methods with the aid of diagrams.
- What is the steps involved in the design of the DC chopper
- What are the types of switching regulators and explain each type mode of operation?

The Fourth Question (20- Marks)

- Define AC voltage controller? write some applications of them.
- List the main types of AC voltage controller?

- c) Explain the principle of the on-off control and Phase control for AC voltage controller?
- d) What are the disadvantages of AC voltage controller?

The Fifth Question (20- Marks)

- a) Define the inverter and mention the main disadvantages? write some applications of it.
- b) What size inverter do I need?
 - i. Starting load
 - ii. Continuous load
- c) What is the main method for voltage control within the inverter? Explain two techniques.
- d) What are the advantages and disadvantages of harmonic elimination technique?

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