



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: 1 No. of questions: 4  
Allowed Tables and Charts: (None)

**Answer All The Following Questions:**

**The First Question:**

**[25- Marks]**

- 1- What are the differences between load side and line side commutation?
- 2- What are the advantages of a three phase rectifier over a single phase rectifier?  
Show your answer with a simple drawing
- 3- List the main types of chopper and discuss the principle of operation of them.
- 4- Define AC voltage controller? write some applications of them.
- 5- Mention the different applications of inverter in practice?

**The Second Question:**

**[25- Marks]**

- 1- What is the purpose of filter in rectifiers circuits?, What is the difference between ac and dc filter?
- 2- Explain how a three semi converter operates, draw its circuit and its waveforms?
- 3- What are the advantages and disadvantages of harmonic elimination technique?
- 4- Show the operation of reversing in three-phase AC switches and draw the reversing circuit?
- 5- What is the main method for voltage control within the inverter? Explain two techniques.

**The Third Question:**

**[25- Marks]**

- 1- What are the advantages and disadvantages of buck and boost regulators ?
- 2- What is the difference between centre-tap and bridge in single phase rectifier?  
Show your answer with a simple drawing
- 3- What is the function of the freewheeling diode in single-phase semi converter ?
- 4- Explain the principle of the on-off control and Phase control for AC voltage controller?

**The Fourth Question:**

**[25- Marks]**

- 1- Mention the types of DC power supplies and discuss one of them
- 2- Mention some applications of ac to dc rectifier.
- 3- What is the principle of phase control for controlled rectifier?
- 4- What are the types of switching regulators and explain each type mode of operation?
- 5- List the main types of AC voltage controller? What are the disadvantages of AC voltage controller?

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