



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 (25 Marks)

- 1- Define the power quality? then explain power quality problems, causes and effects of every problem?
- 2- Mention effects of poor power quality on customer side and utility side?
- 3- What are techniques to mitigate poor power quality ?
- 4- Define active power filter? Mention mainly two types? then mention advantages and disadvantages of active power filter?

The Second Question (25 Marks)

- 1- What is the effect of harmonics on the power system?
- 2- What are the desirable features of a power factor correction techniques for both input and output sides ?
- 3- Explain different types of passive power factor correction (PFC)? list advantages and disadvantages of passive power factor correction?
- 4- Explain how to use Buck, Boost, and Buck Boost converter in power factor correction ?
- 5- Mention power factor correction methods?

The Third Question (25 Marks):

- 1- Explain concept of fault tolerance control? Mention different topologies which have been used to achieve fault tolerant?
- 2- Explain Switch Redundant Topology and its cases?
- 3- What factors are used for the comparison of fault tolerant power electronics converters ?
- 4- Explain concept of fault tolerance control of induction motor drive system with feed converter?

The Fourth Question (25 Marks)

- 1- Mention the advantages and disadvantages of fuzzy logic controller?
- 2- Mention steps of constructing a fuzzy controller ?
- 3- Discuss the influence of increasing / decreasing the number of membership ?
- 4- Explain how to use FLC in series excited dc motor drives?
- 5- List the optimization methods of FLC . and explain one of them?

With best wishes

Prof. Elwy E. El-kholy