Answer All The Following Questions:

The First Question (20- Marks)

a) What are the advantages and disadvantages of multilevel inverter (MLI)?

b) What are the fundamental types of MLI?

c) If you have eight active switches and two variable DC sources. Draw the power circuit, output waveform. Determine the ratio between DC sources and explain the principle of operation in the following cases:
- To obtain 5 levels output waveform.
- To obtain 7 levels output waveform.

The Second Question (20- Marks)

a) Explain the on-off phase control for the AC voltage List the main types of AC voltage controller?

b) What is the principles of the AC voltage controller?

c) What are the disadvantages of AC voltage controller?

d) Mention some applications used the AC voltage controller for AC motors.

The Third Question (20- Marks):

a) What is the main types of DC choppers?

b) List the applications of the DC chopper for DC motor.

c) Explain the restrictions during designing the DC Chopper?

The Fourth Question (20- Marks)

a) Explain the difference between single and three phase inverter?

b) List two techniques used for controlling the inverter output voltage.

c) Mention some applications used the inverter for AC motors.

The Fifth Question (20- Marks)

a) Describe the block diagram of the fuzzy logic control technique?
b) Discuss the influence of increasing/decreasing the number of memberships?
c) Explain the difference between Fuzzy logic controller and PI Controller for motor speed control loop?
d) Explain the advantages and disadvantages of the FLC?

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