**KISII UNIVERSITY**

**SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY**

**Department of Computing Sciences**

**COMP100/BIT111**

**UNIT NAME: Computer Organization and Architecture**

Instructions: Answer Question **ONE** and any **TWO** Questions

**Question One**

a. Explain the concept computer architecture (4 marks)

b. Describe the concept of functional units of computer system giving any four examples of those functional units. (5 marks)

c. Explain procedure of performing disk defragmentation hence state its goal. (5 marks)

d. Explain the term stored program control unit as applied in computer memory. (2 marks)

e. Describe the concept of instruction set completeness and cite any four examples that you may know. (5 marks)

f. Elucidate the term hardwired control organization. (5 marks)

g. Explain three components of a hardwired control organization. (6 marks)

**Question Two**

a. Describe the term parallel processing and state its objective. (5 marks)

b. Explain the term pipelining and state the difference between arithmetic pipeline and instruction pipeline. (6 marks)

c. Explain the term deadlock as used in process management. (4 marks)

d. Describe the concept of transistor-transistor logic hence highlight its main applications. (5 marks)

**Question Three**

i. A program residing in the memory unit of a computer consists of a sequence of instructions. With the aid of a diagram, explain the phases involved in the instruction cycle. (10 marks).

ii. A digital computer consists of a number of hardwired components, describe any five of such components. (10 marks)

**Question Four**

a. Explain any six control logic gates used in a basic computer, in each case draw it and show both the input and the output. (12 marks)

**b.** Describe the concept of a digital computer using a suitable block diagram. (8 marks)

**Question Five**

a. Draw an electronic circuit for the algebraic function X=AB.CD (6 marks)

b. Binary algebra can be considered as an algebra that deals with logic variables and Boolean operations. Give the logic diagram for the Boolean function S=ABC+ABC+XYZ.NMP. (8 marks)

c. Highlight any three levels of cache memory. (6 marks)