QUESTION ONE (30 MARKS)

1. a) With the aid of a suitable block diagram explain the operation of a von Neumann computer. 5Marks

b) Define the following terms

i. Finite state machines
ii. Carry look ahead adder
iii. Combinational circuits
iv. Dedicated microprocessors
v. Sequential circuits. (5Marks)

c) With the aid of a suitable block diagram. Describe the parts fitted together to form a processor. (5Marks)

d) Define design abstractions. (5Marks)

e) Describe VHDL and its functions. (5Marks)

f) Explain how a program that describes the operation of a circuit converts to a physical circuit. 5Marks

QUESTION TWO (20 MARKS)

a) Discuss combinational components and signal naming conventions. (10Marks)

b) Construct an adder for adding two binary numbers

$X=X_{N-1}.....X_0$ and $Y=Y_{N-1}.....Y_0$

10Marks

QUESTION THREE (20 MARKS)

a) Distinguish between Ripple carry adder and carry look ahead a head. (10Marks)

b) Define sequential circuits and their naming conventions. (10Marks)

QUESTION FOUR (20 MARKS)

a) Explain the operation of the finite state machine models. (10Marks)

b) Discuss memory contraction and its applications in registers and counters. (10Marks)

P.O. Box
NYAHI
KEN

QUESTION FIVE (20 MARKS)

a) Describe the process of analyzing sequential circuits. (10Ma

b) Explain the process of synthesizing sequential circuits. (10Ma