



AFRICA NAZARENE UNIVERSITY

CENTRE: RONGAI
DEPARTMENT: COMPUTER SCIENCE
UNIT TITLE: FUNDAMENTALS OF COMPUTER SYSTEM
UNIT CODE: CSC 101
LECTURER: J. ARIMBI
TRIMESTER: 2ND TRIMESTER 2014/2015
DATE: 14TH APRIL, 2015
TIME: 9.00 AM – 12.00 PM

Instructions:

1. Answer question **ONE (Compulsory)** and any other **THREE** questions.
2. Write all your answers in the answer booklet provided.
3. Time: Three hours.

Question One: (30 Marks)

- a) Computers have evolved through three generations, name them? State the generation under which a slide rule is classified. **(2 Marks)**
- b) A computer statement has a length of one byte and $2\frac{1}{2}$ - nibbles, how many bits are there in all? **(2 Marks)**
- c) A computer system bus comprises of the address bus, the data bus and the control bus. Give the role played by each bus in a computer system? **(3 Marks)**
- d) Classify the following storage types into either primary or secondary storage and give typical storage capacities of each : CD-ROM, RIMM, Flash disk, EEPROM. **(4 Marks)**
- e) Define the term algorithm as applied to a computer program and state its two properties that are a measure of the efficiency of a program. **(4 Marks)**
- f) Evaluate:
- i. $10000_2 \div 111_2 =$ (give your answer to 2-binary places) **(3 Marks)**
 - ii. $5ED_{16} + 463_8 =$ (give your answer in binary) **(2 Marks)**
- Perform the conversions:
- i. 785.75_{10} to binary **(2 Marks)**
 - ii. $AC4_{16}$ to Octal **(2 Marks)**
- g) Sketch the standard symbols of the basic logic gates (AND, OR, NOT) and derive their truth tables **(6 Marks)**

Question Two: (10 Marks)

- a) With the help of a block diagram describe the functions of the components of a microprocessor based computer system. **(8 Marks)**
- b) Outline the stages of 3-phase instruction execution cycle of a computer system. **(2 Marks)**

Question Three: (10 Marks)

- a) Computers can be classified by the type of signal they process or by size. Elaborate **(6 Marks)**

b) Distinguish between:

i) System software and application software and list one typical example of each.

(2 Marks)

ii) What are the basic functions of an operating system in a computer system?

(2 Marks)

Question Four: (10 Marks)

With reference to a 3-variable K- map, carry out the following:

i) Sketch the K- map

(2 Marks)

ii) Map the terms of the equation $\Sigma (0,1,4,5)$

(2 Marks)

iii) Derive a Boolean equation from the K- map

(3 Marks)

iv) Sketch a logic circuit using NAND gates only

(3 Marks)

Question Five: (10 Marks)

a) Define the term pseudo code as applied to a program.

(2 Marks)

b) Use standard symbols and sketch a flow chart for a program that reads displays and adds integer values of two variables A and B and stores the result in C.

(8 Marks)

