



(Knowledge for Development)

KIBABII UNIVERSITY COLLEGE

A CONSTITUENT COLLEGE OF

MASINDE MULIRO UNIVERSITY OF

SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER

MAIN EXAMINATION

FOR THE DEGREE OF

BACHELOR OF SCIENCE COMPUTER SCIENCE

COURSE CODE: CSC 321

COURSE TITLE: COMPUTER ARCHITECTURE

DATE: 7TH MAY, 2015

TIME: 8.00AM-10.00AM

INSTRUCTIONS TO CANDIDATES

Answer Question One in Section A and Any other TWO (2) Questions in Section B

TIME: 2 Hours

QUESTION ONE (30 Mk)

- i. State and briefly explain the number of possible Boolean functions for two variables $n=2$ (4 Mk)
- ii. State and explain one major advantage of CMOS (4 Mk)
- iii. With clear step by step explanation implement the operation below in two's complement: (4 Mk)
 $-6 + -13$
- iv. What are the major components of a CPU? (3 Mk)
- v. How many 8 bits words can 64K memory hold? (1 Mk)
- vi. Explain your answer in (v) above (3 Mk)
- vii. Name the techniques that automatically move program and data blocks into the physical main memory when they are required for execution. (1 Mk)
- viii. Explain the techniques in (vii) above (3 Mk)
- ix. A computer has memory of 256k words of 32 bits each, how many bits are required to specify the address part? (1 Mk)
- x. Justify your answer in (ix) above (2 Mk)
- xi. Which is the simplest way to for a computer system to determine cache locations in which to store memory blocks? (1 Mk)
- xii. Justify the your answer in (xi) above (3 Mk)

QUESTION 2 Memory (20 Mk)

- i. Discuss Computer Memory types based on data units' access methods (8 Mk)
- ii. Briefly explain any two performance parameters users consider in memory deployment (4 Mk)
- iii. Briefly discuss the following types of ROM (8 Mk)

QUESTION THREE I/O Sub System (20 Mk)

- i. State 3 major functions of the I/O module of a Computer

- System (3 Mk)
- ii. Describe the sequence of step that might be involved in transfer of data from an external device to the processor. (5 Mk)
 - iii. Name four components involved in Process Communication (4 Mk)
 - iv. Using a clearly labeled block diagram, illustrate the architecture of a micro-Programmed Control Unit (8 Mk)

QUESTION 4: INSTRUCTIONS SET (20 Mk)

- i. Outline four elements of a machine Instruction (8 Mk)
- ii. What is Accumulator? (2 Mk)
- iii. Briefly explain the concept of Base Register Addressing (2 Mk)
- iv. The bulk of the binary information in a digital computer is stored in memory. With clear explanation outline where Computations are done? (4 Mk)
- v. With brief explanation, describe any four types of memory Registers (4 Mk)

QUESTION FIVE: Parallel Organization 20 Mk

- i. Explain three models that have been used over time to enhance Instruction-level Parallelism in computer architecture (6 Mk)
- ii. Outline one way in which modern processor design is controlling power Density (2 Mk)
- iii. Using a clearly labeled block diagram, outline the structure of a Intel Core Duo processor (4 Mk)
- iv. Describe the four categories of Parallel Processor systems as outline in Flynn's Taxonomy (8 Mk)