



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

(BSC IT –Y3 SI)

BACHELOR OF TECHNOLOGY IN INFORMATION & COMMUNICATION TECHNOLOGY

(BTECH ICT Y3 SI)

EIT 4304: COMPUTER ARCHITECTURE & ORGANIZATION

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions

Answer any **THREE** questions. Question **ONE** is Compulsory

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

SECTION A (Compulsory - 20 marks)

Question One (20 Marks)

- a) Define the following terms:
- i) Central Processing Unit (CPU)
 - ii) Logic gate
 - iii) Cache
 - iv) Instruction set (4 marks)
- b) Differentiate between:
- i) Computer architecture and computer organization
 - ii) Registers and Memory (4 marks)
- c) Discuss the **FOUR** major function of a computer processor (4 marks)
- d) Using a block diagram, illustrate how the control unit (CU) instructs the other parts of the CPU through a set of **FOUR** basic operations (8 marks)
- e) With the help of truth tables and symbols, discuss the basic combination of gates (10 marks)

SECTION B (Answer any TWO questions – 40 Marks)

Question Two (20 marks)

- a) Differentiate between single-chip computers and single board computers (2 marks)
- b) What is a system bus? Briefly describe the THREE main classes of system buses (4 marks)
- c) Give TWO reasons why the binary number system is utilized for modern electronic digital computers (4 marks)
- d) Perform the following conversions (4 marks)
 - i) Convert binary 00011011 to decimal
 - ii) Convert decimal 278 to binary
 - iii) Convert decimal 0.625 to binary
 - iv) Convert 19B116 to binary
- e) List the SIX important CPU registers and state their functions (6 marks)

Question Three (20 marks)

- a) Give the full form and function of the following terms as applied to computer system architecture. (6 marks)
 - i) CMOS
 - ii) BIOS
 - iii) RAM
 - iv) ROM
 - v) SIMM
 - vi) DIMM
- b) Using a multi-layered computer architecture table discuss the importance of Digital Logic layer (4 marks)
- c) Compare RISC and CISC architectures giving advantages and disadvantages of each. (10 marks)

Question Four (20 marks)

- a) Briefly describe: (5 marks)
 - i) Processor to Memory Communication
 - ii) Processor to I/O Communication
- b) Explain with block diagram single bus organization of the data inside a processor (10 marks)

Question Five (20 marks)

- a) Why is the concept of Boolean algebra important to the digital computers and other digital systems? Give at least TWO reasons (4 marks)
- b) With the help of Logic symbols and truth tables, describe the THREE basic logic gates (6 marks)
- c) Give and Boolean expression and the truth table for the following logic operations (4 marks)
 - i) 2 inputs AND gate
 - ii) 2 inputs OR gate
- d) Explain the basic operational concept of a digital computer (6 marks)