



TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

UNIVERSITY EXAMINATION FOR:
BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY
(BTIT 11M – Y4 S1)

EIT 4411: MICROPROCESSOR SYSTEMS DESIGN

END OF SEMESTER EXAMINATION

SERIES: APRIL 2014

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions.

Attempt question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

- a) Enumerate the applications of a microcontroller. **(4 marks)**
- b) State the function of JNZ instruction. **(2 marks)**
- c) Define the stack and stack pointer. **(4 marks)**
- d) Explain with appropriate diagram the concept of demultiplexing ADO-7 line in 8085. **(6 marks)**
- e) Explain the instruction formats of 8085 microprocessor provide an example of each case. **(6 marks)**
- f) Explain the following addressing modes in 8085 provide an example in each case:
 - (i) Direct
 - (ii) Immediate

- (iii) Register
- (iv) Implied

(8 marks)

Question Two

- a) State any FOUR advantages and FOUR disadvantages of a microprocessor based system. (8 marks)
- b) Explain the functions of the following registers in a microprocessor: (6 marks)
 - (i) Instruction register
 - (ii) Flag register
 - (iii) Accumulator
- c) With examples, explain the following instruction set groups: (6 marks)
 - (i) Data transfer instruction
 - (ii) Arithmetic instruction
 - (iii) Machine control instruction

Question Three

- a) Write an assembly language program using the 8085 microprocessor to multiply two 8-bit numbers by repeated addition. (8 marks)
- b) With timing diagram, explain the memory write operation. (10 marks)
- c) A computer has a main memory with 1024 location each of 128 bits. Calculate the total memory capacity in kilobytes. (2 marks)

Question Four

- a) Describe the different types of interrupts used in 8085 microprocessor. (8 marks)
- b) Explain with a diagram the architecture of 8051 microcontroller. (12 marks)

Question Five

- a) Determine the values of the Accumulator register carry flag and parity flag after execution of each instruction in the following sequence:
 - MOV AL, 20h
 - MOV BL, 30h
 - ADD AL, BL(9 marks)
- b) Explain any three functions of the I/O interface controllers in microcomputers. (3 marks)
- c) With the aid of a diagram, show how a 64K x 4 RAM is obtained from a 16K x 4 RAM chip. (8 marks)