



MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNIVERSITY ORDINARY EXAMINATION

2017/2018 ACADEMIC YEAR

**THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DIPLOMA IN
ELECTRICAL AND ELECTRONIC ENGINEERING**

SEE 1304 – MICROPROCESSOR & MICROCONTROLLERS

DURATION: 2 HOURS

DATE:

TIME:

Instructions to Candidates:

1. Answer **Question 1** and **Any Other Two** questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A (Compulsory)

QUESTION ONE

- a) Explain any two (2) differences between microprocessors and micro controllers. (4 Marks)
- b) Enumerate any two (2) data transfer instructions of 8085 microprocessors. (2 Marks)
- c) Distinguish between the following registers as used in microcontrollers and microprocessors;
 - i. Dedicated registers
 - ii. General purpose registers (4 Marks)
- d) State any four (4) reasons why the transfer of data between the microprocessor and the I/O devices require an interface (4 Marks)
- e) Explain the following 8085 microprocessor addressing modes giving an example of each
 - i. Immediate
 - ii. Direct
 - iii. Register (6 Marks)
- f) Explain any two (2) applications of microcontrollers. (4 Marks)
- g) Explain any three (3) differences between non Neumann and Harvard microcontroller architectures. (6 Marks)

SECTION B (Answer any two (2) questions)

QUESTION TWO

- a) Describe a simple microprocessor based system explaining the functions of different parts. (6 Marks)
- b) With the aid of a diagram, explain the I/O mapped I/O method of data transfer. (7 Marks)
- c) Study the following assembly language programme and answer the questions that follow;

```
MVI B, 48H
MVI C, 96H
XRA A
ADD B
ADD C
DAA
MOV D, A
HLT
```

- i. Explain what happens after
XRA A
DAA
HLT (3 Marks)
- ii. Indicate the content of registers A, B, C and D when this programme is executed. (4 Marks)

QUESTION THREE

- a) Highlight any four (4) steps that a microcontroller processor undertakes to execute an instruction (4 Marks)
- b) Explain any three (3) ways in which microcontrollers are classified. (6 Marks)
- c) With the help of a diagram describe the architecture of the central processing unit of a microcontroller. (10 Marks)

QUESTION FOUR

- a) A 16-bit microprocessor has 10 address lines. Determine;
 - i. The word length
 - ii. The number of memory locations the processor can address. (3 Marks)
- b) Distinguish between dynamic random access memory (DRAM) and static random access memory (SRAM) highlighting an example for each. (6 Marks)
- c) An 8085 microprocessor based system has the following memory specifications, 2KX8 RAM mapped from address 00000H and 2KX8 ROM mapped from the memory location following RAM in the memory space. Determine the border address for both RAM and ROM and hence draw the memory map for this system. (11 Marks)