MURANG'A UNIVERSITY COLLEGE

(A Constituent College of Jomo Kenyatta University of Agriculture and Technology)

DEPARTMENT: **ELECTRICAL ENGINEERING**

LEVEL: **DIPLOMA**

CLASS: **KNEC/EEP/15DJ3**

TERM/SEMESTER: **I**

ACADEMIC YEAR: **2014/2015**

UNIT: **MICROPROCESSORS**

UNIT CODE: **EE1304**

DATE: 29TH APRL 2015   **TIME: 3 HOURS**

Instructions to candidates

This paper contains Seven (7) questions

Attempt any FIVE (5) Questions

Answer all the questions

You should have the following for this examination;
- Drawing instruments
- Scientific calculator

Mobile Phones are NOT ALLOWED in Examination Room.

1. (a) With the aid of a well labelled diagram explain the 8085 Microprocessor architecture. (8 mks)
   (b) Explain three main functions of the C.P.U. (3 mks)

   (c) Explain the microprocessor bus oriented system (6 mks)

   d) Explain the microprocessors status flag highlighting important features and conditions (3 mks)
2. (a) Explain the following types of computers:
   i) Mainframe
   ii) Supercomputer
   iii) Minicomputers
   iv) Desktop computers (6 mks)

   b) With the aid of a diagram explain a tri-state data bus buffers and the reason why it is used in a bus oriented system. (4 mks)

c) Explain the following microprocessors' addressing modes giving examples
   i)   Direct
   ii) Immediate
   iii) Register   (6 mks)
   d) Explain the following microprocessors timing and control satus instructions
   i)   HOLD
   ii)HLDA   (4 mks)

3. (a) With the aid of a diagram explain the operation of a dynamic RAM Cell. (8 mks)
   (b) Explain any FOUR types of semiconductor memories.   (6mks)
   (c) Explain the historical development of microprocessors explaining the main
       characteristics of Von Newman machines   (6mks)
4. (a) (i) Explain the fetch execute cycle of a microprocessor based system.
       (ii) Draw a circuit diagram demonstrating how to create a 32k x 8 EPROM from
            two 16k x 8 EPROM and showing all signal connections.   (12 mks)
   (b) Explain the importance of a Memory Map.   (2 mks)
   (c) A memory map consists of ROM1 occupying locations 0003H to 0FFDH and
       ROM 2 occupying locations 0FFDH to FFFFH. If each stored word is 8 bits
       long, determine the total capacity of ROM 2. Address for ROM 1.   (6 mks)

5. (a) A microcomputer system requires 8Kbytes of ROM and 1024 Bytes of RAM.
       (i) Determine the start and end address of each memory block if the two blocks
           occupy contiguous memory address with ROM address starting at 0000H.
       (ii) Draw the memory map of the system.   (8 mks)

   (b) Explain the function(s) of the following microprocessor internal registers:
           i.Accumulators
          ii.Index registers
         iii.Program counter
          iv.Stack pointer   (6 mks)
   (c) With the aid of a diagram. Explain how DMA data transfer is executed in
       a Microprocessor based system.   (6 mks)

6. a) Explain the Sequence of events when an Interrupt occurs   (6mks)

   b) List TWO modes of data transfer in a microprocessor system   (2mks)

   c) With the aid of a diagram differentiate between Asynchronous and
      Synchronous methods of data transfer.   (6mks)

   d) Explain 3 differences between a subroutine and an interrupt   (6mks)
7. a) List Two Methods of Polling.   (2mks)

 b) Explain the importance of memory mapping and organization   (2mks)

 c) With the aid of a diagram explain the Z80 Microprocessors highlighting
    its salient features.
                                                                         (8mks)
 d) Explain SIX factors to be considered when selecting a microprocessor for
    a particular application.   (6mks)

 e) Define the following terms
    i) Operand
    ii) Opcode   (2mks)