MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER MAIN EXAMINATIONS

FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN HYSICS WITH APPROPRIATE TECHNOLOGY AND BACHERLOR OF EDUCATION

COURSE CODE: SPH 445

COURSE TITLE: MICROPROCESSOR INTERFACING

DATE: THURSDAY 21ST APRIL, 2022   **TIME:** 12:00PM – 2:00 PM

INSTRUCTIONS TO CANDIDATES

TIME: 2 Hours

Answer question ONE and any TWO of the remaining.
Symbols used bear the usual meaning.

MMUST observes ZERO tolerance to examination cheating

QUESTION ONE (30 marks)

a) Distinguish between a microprocessor and a microcontroller. (2 marks)
b) Give reasons why the data bus in microprocessor is bidirectional (2 marks)
c) Differentiate between Opcode and Operands (2 marks)
d) Distinguish between hardware interrupts and software interrupts. (2 marks)
e) State and give the labels of the four general data registers. (2 marks)
f) Describe the following Fetch cycle and instruction cycle. (2 marks)
g) What is the advantage of R/2R ladder DAC over the DAC that uses binary weighted resistors? (2 marks)
h) List the five Instruction sets of the of 8085 Microprocessor. (2 marks)
i) What are the handshake signals used in mode -2 configuration of the 8255 microprocessor? (3 marks)
j) Differentiate between timers and counters and draw the diagram of TCON in 8051 microcontroller. (5 marks)
k) State and explain briefly the three architectures of multiprocessor system. (6 marks)

QUESTION TWO (20 marks)

a) Sketch and explain the various pins of the 8085 microprocessor (8 marks)
b) Describe the following:
   (i) Programmed I/O (6 marks)
   (ii) Interrupt I/O (6 marks)

QUESTION THREE (20 marks)

a) Give the Basic description of the 8279 pin configuration and explain how you will interface a 8 digit display and a 64 keys keyboard to the CPU using the 8279. (10 marks)
b) With neat block diagram, explain the features of programmable interval timer. (10 marks)

QUESTION FOUR (20 marks)

a) Draw a general block diagram of a microprocessor and explain briefly the various block of the system. (10 marks)
b) Draw and illustrate the block diagram of DAC converter (7 marks)
c) A 5-bit DAC has a current output. For a digital input of 101000, an output current of 10mA is produced. What will I_{OUT} be for a digital input of 11101? (3 marks)

QUESTION FIVE (20 marks)

a) With neat sketch explain the operation of 8255 PPI. (8 marks)
b) Explain with aid of a neat sketch the function of DMA controller (8 marks)
c) Describe the basic operation of the IEEE-488 bus. (4 marks)

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