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(University of Choice)

# MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

## UNIVERSITY EXAMINATIONS 2021 ACADEMIC YEAR

## THIRD YEAR EXAMINATIONS

## BACHELOR OF COMPUTER SCIENCE

**COURSE CODE:** BCS 322

**COURSE TITLE:** MICROPROCESSOR SYSTEMS

**DATE:** 19/04/2022 **TIME:** 15.00p.m. – 17.00p.m.

**INSTRUCTIONS TO CANDIDATES**

Question ONE (1) and Any OTHER 2 questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

Question1 (30marks) compulsory

a) Explain any 2 differences between Von Neumann and Harvard microcontroller architectures
2 marks

b) Distinguish between the following pairs of Intel 8085 instructions. State the addressing mode of each.
(i) DAB B and ADC B 3 marks
(ii) XRA M and XCHG 3 marks

c)(i) Explain a multiprocessor system and state 2 advantages 4 marks
(ii) what is programmed I/O 2 marks

.d) An 8 bit microprocessor with a 16-bit address bus requires PROM space of 4K bytes and RAM spaces of 16K bytes, occupying a continuous space .Draw the memory map of the system. 6 marks

e). i) Distinguish between partial and full decoding as used in address decoding in microprocessors
2 marks

(ii) Illustrating how the stack memory is effected, describe the sequence of events occur when CALL and RETURN instructions are executed .4 marks

iii) Differentiate between maskable interrupts and non-maskable interrupts with examples.
6 marks

Question 2 (20 marks).

a) Explain why direct memory Access is preferred in transferring blocks of data than either the polling or the interrupt input/output methods. 2 marks

b) Explain the following addressing modes i) direct 2 marks
ii) indirect 2 marks
iii) relative address 2 marks
iv) based index addressing 3 marks)

c) **Explain i) the stack used in 8085** 3 marks
ii)use of IP register 3 marks
iii) List the allowed register pairs of 8085 microprocessor 3 marks

Question 3 (20 marks

a) **What are level-triggering interrupst?** 4 marks
**Explain a hardware interrupt and give one example 4 marks**
b) **Explain why a crystal is a preferred clock source** in microprocessors 4 marks
c) **In 8085 which is called as High order / Low order Register** 4 marks
d) **Explain What happens when HLT instruction is executed in processor 4 marks**

Question 4 (20 marks).

a) What is a flag? 3 marks
b) Using a suitable diagram explain 3 flags in the flag register 6 marks
c) i) What is the use of ALE pin 3 marks
ii) How many machine cycles does 8085 have, list 2 5 marks
iii) . Explain LDA, STA and DAA instructions 3 marks

Question 5 (20 marks).

a)i) Explain the purpose of SID and SOD lines in 8085 microprocessor 4 marks

ii Explain how execution time of an instruction calculated 4 marks

b)What is the value in AL after the following instructions are executed MOV AL, 35H;
ADD AL,49H;
DAA 6 marks

c Discuss 3 software interrupts 6 marks