

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
AUGUST EXAMINATIONS 2009

SUBJECT: MICROPROCESSORS AND EMBEDDED SYSTEMS

CODE: SCS2202

INSTRUCTION TO CANDIDATES

This question paper consists of **six (6)** questions, each carrying 25 marks.

Answer any **four (4)** questions

Time: 3 hours

QUESTION ONE

- a) Give a detailed outline of the evolution of the microprocessors to microcontrollers [10]
- b) Describe the internal architecture of the Intel 8085 microprocessor. [15]

QUESTION TWO

- a) Give a detailed outline of interrupt system organization in an Intel 8085 microprocessor. [13]
- b) Compare and contrast the Intel 8085 microprocessor and the Motorola MC 6800 microprocessor. [12]

QUESTION THREE

- a) Distinguish between the general – purpose microprocessor and the microcontroller [4]
- b) Explain the following
 - i) Machine cycle [3]
 - ii) Instruction cycle [3]
 - iii) What determine the power of any microprocessor? Explain in detail. [6]

- c) Discuss the following registers:
- i) Accumulator [3]
 - ii) Program counter [3]
 - iii) Instruction register [3]

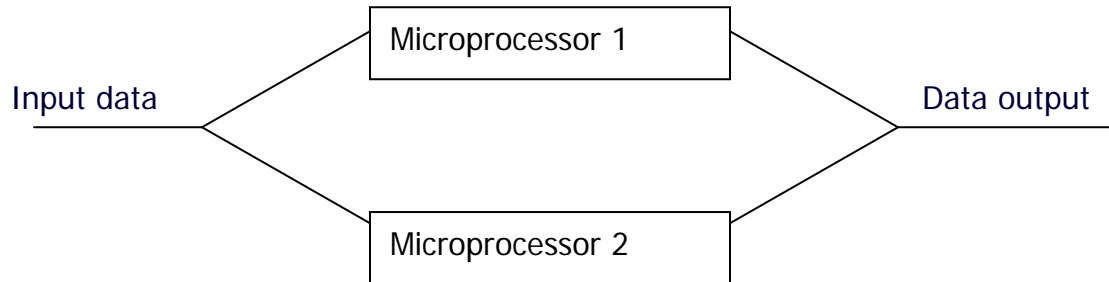
QUESTION FOUR

- a) Write an assembly language program to add 32H and 41H and store the result in register HL. [4]
- b) Give a detailed account of the following types of memory
- i) EPROM [3]
 - ii) EEPROM [3]
 - iii) MASKED ROM [3]
 - iv) PROM [3]
 - v) FLASH [3]
- c) Write detailed notes on any six special function registers of an 8051 microcontroller. [6]

QUESTION FIVE

- a) Describe fully the following MC6800 microprocessor signals.
- i. READ/WRITE (R/W) [4]
 - ii. VALID MEMORY ADDRESS (VMA) [4]
 - iii. NON-MASKABLE INTERRUPT (NMI) [4]
- b) Discuss the addressing modes of an 8085 microprocessor. [9]

- c) The diagram below shows two microprocessors connected in parallel.
Explain the process that takes place. [4]



QUESTION SIX

- a) What characteristics should a system have in order for it to be classified as an embedded system? [2]
- b) Discuss the architecture of an 8051 microprocessor. [6]
- c) Explain the following:
- i) Instruction set [3]
 - ii) Pipelining [3]
 - iii) Cache memory [3]
 - iv) Co-processing [2]
 - v) Bus width [1]
 - vi) Word length [1]
- d) Determine the bandwidth for the MC6800 microprocessor bus given that the motherboard operating frequency is 4MHz. [4]

END OF QUESTION PAPER

