

BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF SCIENCE AND ENGINEERING
HPH447: MICROPROCESSORS
DEPARTMENT OF ENGINEERING AND PHYSICS
BACHELOR OF SCIENCE (HONOURS) IN PHYSICS WITH SPECIALISATION
3 HOURS

JUN 2023

INSTRUCTIONS

Answer ALL questions. The examination paper carries 100 marks.

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- 1 (a) What are the three main units of a digital computer? [3]
- (b) (i) What is a microprocessor? [2]
- (ii) 11. What is the function of a microprocessor in a system? [2]
- 2 (a) (i) Convert $29B_{16}$ to binary. [2]
- (ii) Convert 100111110101_2 to hexadecimal. [2]
- 3 (a) (i) What is a bus? [2]
- (ii) What are the different buses and what jobs they do in a microprocessor? [3]
- 4 (a) What are the operations performed by the ALU of the 8085 microprocessor? [4]
- (b) Explain the function of IO/M in 8085. [2]
- (c) Define machine cycle. [3]
- 5 (a) (i) What is machine language programming? [2]
- (ii) What is meant by assembly language programming? [2]
- (b) (i) What are meant by low level and high-level languages? [4]
- (ii) How are high level languages converted into binary? [2]

- (c) What is meant by 'word length' of a computer? [2]
- 6 (a) What is a microcontroller? [2]
- (b) What is the difference between a microprocessor and a microcontroller? [4]
- (c) List any 3 advantages of a microcontroller over a microprocessor? [3]
- 7 (a) What is meant by the statement that the 8085 is a 8-bit microprocessor? [2]
- (b) (i) Design a half-Adder circuit diagram and provide the truth table. [8]
- (ii) Give five applications of logic circuits. [5]
- 8 (a) Define a program? [2]
- (d) Into how many categories are computers divided? [3]
- (e) (i) What are the names given to instructions written in high and low level languages? [2]
- (ii) What is a mnemonic? [2]
- (ii) Define instruction cycle? [1]
- 9 (a) (i) What is an instruction set? [1]
- (ii) Give the functional categories of the 8085 microinstructions? [4]
- (b) What is an OS (operating system) and what are its functions? [4]
- (c) Indicate the different machine cycles of 8085. [7]
- 10 (a) What are the temporary registers of the 8085? [2]
- (b) (i) What is an instruction? [1]
- (ii) What an instruction essentially consists of? [3]
- 11 (a) What is a flag? [2]
- (b) (i) Explain maskable and non-maskable interrupts. [2]
- (ii) Which is the non-maskable interrupt for 8085? [2]

(c)

What is a development board?

[2]

END OF EXAM