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UNIVERSITY EXAMINATIONS 2024/2025

FOURTH YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF TECHNOLOGY IN ELECTRICAL AND ELECTRONIC ENGINEERING

EET 3400: MICROPROCESSOR ARCHITECTURE AND INTERFACING

DATE: JANUARY 2025

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- (a)(i) State any TWO advantages of Intel 8086 over 8085 microprocessors
- (ii) Define computer system interfacing and give an example (4 Marks)
- (b) With reference to Intel 8085 architecture, explain with examples the main functions the following:
- (i) Timing and control unit
- (ii) Arithmetic and logic unit
- (iii) General purpose registers (6 Marks)
- (c) (i) Distinguish between immediate and indirect addressing modes as applied to Intel 8085 microprocessors, giving an example of each



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- (ii) Explain the instruction formats of an Intel 8085 microprocessor (6 Marks)
- (d) Design the Opcode-fetch machine cycle timing diagram of an Intel 8085 microprocessor and state its operation (8 Marks)
- (e) (i) Differentiate between assembler directives and operators as used in assembly language modular programming
- (ii) Convert the following computing numbers:
- (I) B5H into binary
- (II) 111101.1001₂ into Hexadecimal (6 Marks)

QUESTION TWO (15 MARKS)

- (a) With reference to assembly language programming explain the operations:
- (i) Loading
- (ii) Relocating
- (iii) Linking of the program (6 Marks)
- (b) (i) Outline the functions of ORG, EQU and DS. B assembler directives that allow macro definitions
- (ii) Draw the bus organization system of 8085 microprocessor and outline the main functions of each bus (9 Marks)

QUESTION THREE (15 MARKS)

- (a) With reference to assembly language programming define the following, types of code giving an example of each
- (i) Source code
- (ii) Opcode
- (iii) Mnemonics code (6 Marks)
- (b) (i) Design an Intel 8085 interfacing circuit with an EPROM memory using 3x8



decoder

- (ii) Outline the main functions of the following interrupts used in Intel 8085 microprocessor

(I) Stack

(II) Set Interrupt Mask

(III) Read Interrupt Mask

(9 Marks)

QUESTION FOUR (15 MARKS)

- (a) With the aid of waveforms explain the Write/Read cycles of an Intel 8085 microprocessor

(8 Marks)

- (b) Write an assembly language program to input 8-bit serial data through Serial Input Data line of 8085 microprocessor and convert it to 8-bit parallel data and store this data to 2400H memory location

(7 Marks)

QUESTION FIVE (15 MARKS)

- (a) (i) Outline the main functions of bus latching and buffering in a microprocessor

- (ii) Using flip-flops design Bidirectional Octal transceiver buffer and D-type Latches of Intel 8086 microprocessor

(7 Marks)

- (b) Interface a 4kB memory chip to an 8085 microprocessor with starting address as A000H and implement the system using NAND gates only.

(8 Marks)



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