

Total No. of printed pages = 7

END SEMESTER EXAMINATION, NOVEMBER-2018

Semester – 5th

Subject Code : CAI-505

MICROPROCESSORS AND APPLICATIONS

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Instructions :

1. All questions of PART-A are compulsory.
2. Answer any five questions from PART-B.

PART – A

Marks – 25

1. Fill in the blanks : 1×10=10

(a) _____ is a programming language that is independent of a given computer.

(b) A group of 8 bits is called _____.

(c) _____ points to a memory location in R/W memory called STACK.

[Turn over

- (d) _____ address lines are required to address 8 KB memory.
 - (e) _____ is a 7-bit alphanumeric code with 128 combinations.
 - (f) The general purpose registers of 8085 are _____.
 - (g) The numbers of registers and memory cells in a 1024×8 memory chip are _____ and _____.
 - (h) _____ is the largest positive integer that can be processed by 8085 at one time.
 - (i) Microprocessor always recognize first byte as _____.
 - (j) The data bus width of the first Intel Microprocessor (4004) is _____.
2. Write true or false : $1 \times 10 = 10$
- (a) The LXI is a two byte instruction.
 - (b) LIFO stack is used in 8085.
 - (c) An instruction has two parts.
 - (d) The instruction SUB A will clear the Reg.B.
 - (e) When reset pin is activated the program counter is cleared (it holds 0000H).
 - (f) Monitor program is stored in R/W memory.

- (g) XRI is an example of logical operation.
 - (h) JNC is a conditional jump instruction.
 - (i) JMP is an unconditional jump instruction.
 - (j) Demultiplexing of lower order address bus is done by the ALE signal.
3. Choose the correct answer : $1 \times 5 = 5$
- (a) Which interrupt has the lowest priority ?
 - (i) INTR
 - (ii) TRAP
 - (iii) RST 6.5
 - (iv) RST 5.5
 - (b) A stack is
 - (i) an 8 bit register
 - (ii) a 16 bit register
 - (iii) both (i) and (ii)
 - (iv) a set of memory locations in R/W memory
 - (c) Counter and time delays can be designed in 8085 using
 - (i) Software
 - (ii) Hardware
 - (iii) both (i) and (ii)
 - (iv) None of these

(d) In 8085, register pairs are obtained by combining

- (i) 8 bit registers
- (ii) Accumulator and Flag
- (iii) Accumulator and Memory
- (iv) Stack

(e) Which of the following is an example of data transfer instruction ?

- (i) STA 16-bit
- (ii) ADD M
- (iii) RLC
- (iv) RST 1

PART - B

Marks - 45

4. (a) What is a microprocessor ? Explain the difference between microprocessor and microcontroller. 2+4=6

(b) Define the terms : bit, word and instruction. 3

5. (a) Define the term Flag and explain how the different flags of 8085 are affected. 6

(b) Classify the instructions in terms of their word size and give suitable examples of each. 3

64/CAI-505/M&A (4)

6. (a) Name the five major groups of 8085 instructions with examples. 5

(b) Specify the opcode, operand and meaning of the following instructions :

- (i) MOV M, D
- (ii) ADD B 4

7. (a) If the starting address of the following program is 3050H, then assemble the program. 5

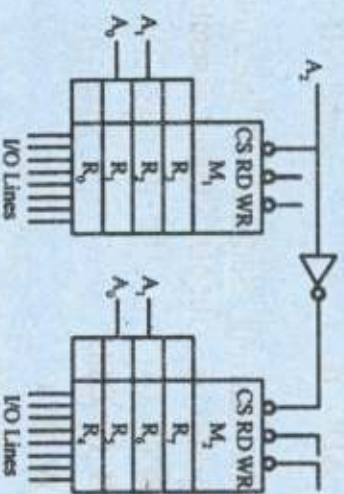
MVI C, DFH
MOV B, C
LDA E200H
SUB B
ANI 11H
STA E300H
RST 1

(b) Write an ALP to subtract two bytes already stored in memory locations C051H and C052H. Location C051H holds 49H and location C052H holds the byte 23H. Subtract the second byte 23H from the first byte 49H and store the answer in memory location DDD0H. 4

64/CAI-505/M&A (5) [Turn over

8. (a) Design a 4-bit register (4 input lines and 4 output lines) to store 4-bits using latches. 5

- (b) For the two memory chips (M_1 and M_2) shown in the figure below, identify the memory address range. 4



9. (a) The memory address of the last location of a 1K byte memory chip is given as FBFFH. Specify the starting address. 3

- (b) Explain the function of ALE and IO/\overline{M} signals of 8085. 4

- (c) If the 8085 has fetched the m/c code located at the memory location DFFFH, specify the contents of program counter. 2

10. (a) Make a comparison between memory mapped I/O and I/O mapped I/O interfacing schemes. 6

- (b) Identify the machine cycles in the following instructions: 3

- * SUB B
- * ADI 55H
- * STA E123H

11. (a) If 8085 adds 87H and 79H, specify the contents of accumulator and the status of sign, zero and carry flag. 4

- (b) Draw the timing diagram of MVI A, 55H instruction. 5