

2021
B. E. (Computer Science and Engineering)
Third Semester
CS-304: Microprocessors

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

Q1.

- (i) How many bits are required in the program counter of a microprocessor if the total memory space to be accessed is 16K bytes.?
- (ii) During which clock cycles of an instruction cycle does ALE appear? What is its function?
- (iii) How does a CPU respond to an interrupt?
- (iv) What is the difference between a conditional JUMP and an unconditional JUMP?
- (v) If the stack pointer points to 0000H, in which memory location will the stack contents be stored if the stack is used?
- (vi) Describe the status of all flags of 8085A microprocessor after each of the following operation carried out in ALU: F8+73; F8+F8.
- (vii) Explain the difference between actions of HLT and HOLD with respect to 8085 MuP.
- (viii) List the machine cycles, the registers involved and the total number of clock cycles needed in fetching and execution of the following instructions: SPHL, STAX D.
- (ix) Explain mode definition control word of 8255. Write the required mode definition control word for the Port A: mode 2 Port B: mode 1 output.
- (x) Write the Control word to configure the timer 1 of 8254 in Mode 2, counting in decimal to be loaded with 16 bit value. (1x10)

SECTION-A

Q2.

- (a) The programs at the addresses 3000 through 3007 and 0038 through 003E are given below. What will be the contents of the registers A, H, and L after the execution of the program at 3000? (The content of memory location 4000 is 55H). (5)

3000 LXI H, 0000	0038 PUSH H
3003 MVI A, 55	0039 LXI H, 4000
3005 MOV L, A	003C MOV A, M
3006 RST 7	003D POP H
3007	003E RET

- (b) With a neat circuit diagram indicate a possible chip select circuit needed to have the address of a memory-mapped I/O port as 7FE7H. (3)
- (c) What is the function of W and Z registers? (2)

Q3.

- (a) Give the function of S1, S0, IO/M', READY pins of 8085 MuP. (2)
- (b) Write an 8085 assembly language program to convert a two-digit hex value to two equivalent ASCII codes, using look up table approach. Display the result at port 1 and port2 respectively. (3)

P.T.O.

(2)

- (c) The memory space of an 8085A based microcomputer consists of one 8K*8 bit EPROM starting from the memory location 0000H to 1FFFH and 8 RAM chips each 1K*8 bit from the location 2000H. Design the decoding circuit to generate chip selects of the above chips. (5)

SECTION-B

Q5.

- (a) Write an 8085 assembly language program to generate a delay of exactly 0.5 second assuming that the internal frequency of operation is 3 MHz. (4)
- (b) Write a program to send out a '1' on the SOD pin of the 8085A if the Zero flag is set, or a '0' if it is reset. (3)
- (c) Write a program which branches to a subroutine TEST if the Auxiliary Carry flag is set. (3)

Q6.

- (a) For initialisation of 8259 the address space available is from 1010H to 1040H. What should be the address of the first CALL (IRO) and why, if the CALL address interval is of four bytes? (3)
- (b) The port addresses of an 8254 PIT in an 8085-run system are as follows: Counter0 A0, Counter1 A1, Counter2 A2 and Control Register A3. Explain what the following two programs achieve and draw the corresponding waveforms. (3)

MVI A,54	MVI A,98
OUT A3	OUT A3
MVI A,03	MVI A,03
OUT A1	OUT A2
HLT	HLT

- (c) Explain the bidirectional mode 2 for Port A in 8255 PPI. (4)

Q7.

- (a) Briefly explain about 8257 DMA controller. (5)
- (b) Show the block diagram to interface 8 switches and a seven segment display to 8085 through 8255 PPI. Write a program to display the switch number when a switch is open. Assume that the 8255 is interfaced in memory mapped IO technique with addresses for port A as 9FF4 H, port B as 9FF5 H, port C as 9FF6 H, and CWR as 9FF7 H. (5)