

**MARWADI UNIVERSITY****Faculty of Technology****Information and Communication Technology****B.Tech.****SEM:3****WINTER : 2019****Subject: Computer Organization and Architecture (01CT0301)****Date: - 10 / 10 / 2019****Total Marks: -100****Time: - 03:00 hours****Instructions:**

1. All Questions are Compulsory.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Question: 1. (a) Objective MCQ [10]

- 1 Which flip-flops is best options to design counters with respect to others
 - A. JK
 - B. T
 - C. D
 - D. SR
- 2 Counter is example of
 - A. Sequential circuit
 - B. Arithmetic circuit
 - C. Combinational circuit
 - D. Logical circuit
- 3 Which instruction can read data from peripheral devices
 - A. STAX
 - B. LHLD
 - C. STA
 - D. IN
- 4 Why 8085 can perform only 8 bit operation easily?
 - A. 8- bit address bus
 - B. ALU capacity is 8 bit
 - C. 8-bit data bus
 - D. 1st letter of name is 8 in 8085
- 5 1 T state is equal to
 - A. 1 clock
 - B. 1 instruction cycle

- C. 1 program cycle
 - D. 1 machine cycle
- 6 Compare T state required for INR and INX
- A. $INR \Rightarrow INX$
 - B. $INR > INX$
 - C. $INR < INX$
 - D. $INR \leq INX$
- 7 To multiply A and B, number of times ADD instruction need to use?
- A. A-1
 - B. A+B
 - C. A-B
 - D. A*B
- 8 Identify odd instruction in this group as per their category
- A. ADD A
 - B. MVI A, 00
 - C. SUB A
 - D. XRA A
- 9 Instruction which can be used to mask few bits
- A. NOA
 - B. ORA
 - C. ANA
 - D. XRA
- 10 If A= 10 and B=20 then after CMP B the status of the flags are
- A. Z=0 and S=0
 - B. Z=1 and S=1
 - C. Z=0 and S=1
 - D. Z=1 and S=0

(b) Define following terms in one line

[10]

- 1 Stack
- 2 Stack pointer
- 3 Instruction Register
- 4 Memory address register
- 5 Memory data register
- 6 Subroutine

- 7 Assembler
- 8 Compiler
- 9 RISC and CISC
- 10 ALE

- Question: 2.**
- (a) Draw various logic gates with truth table and input output relation. [8]
 - (b) What are the various components of any digital computer? Explain each component in detail. [8]

OR

- (b) What is difference between combinational and sequential circuit? List five examples of both types of circuits and explain any one in detail. [8]

- Question: 3.**
- (a) Draw RS, JK, T and D flipflop symbol, Characteristics table and excitation table. [8]
 - (b) Draw diagram of universal shift register. [4]
 - (c) Explain the term “Register Transfer Language” and “Micro operation”. [4]

OR

- (a) What is difference between synchronous and asynchronous counter? Explain method to design counter for the sequence 0,1,2,3,4,5,6,7. [8]
- (b) Design and discuss the method to joint various registers with common data bus. [4]
- (c) Draw the circuit diagram to add or subtract 4-bit numbers with single circuit. It should have one controlling element which can be used to control the operation performed on data. [4]

- Question: 4.**
- (a) Draw timing diagram for MVI A,31 H [8]
 - (b) Explain various types of memory used in any computer system. Write advantages and disadvantages of each. [4]
 - (c) What is ALU? Design an ALU in terms of various blocks. [4]

OR

- (a) Draw timing diagram for ADD M [8]

- (b) Compare RISC and CISC architecture of processor. [4]
- (c) Draw block diagram of 8085. [4]

- Question: 5.**
- (a) Draw timing diagram for MOV A,B [8]
 - (b) Design 1K X 8 memory block with 512 X 4 memory blocks. [4]
 - (c) What is RAM? What are the two types of RAM? Explain in detail. [4]

OR

- (a) Draw timing diagram for OUT 56H [8]
- (b) What is ROM? What are the various types of ROM? Explain in detail. [4]
- (c) Design 1K X 8 memory block with 256 X 4 memory blocks. [4]

- Question: 6.**
- (a) Write an assembly language program to multiply two 8-bit numbers stored in Register A & Register B. [8]
 - (b) Write an assembly language program for [4]
 - A. Load Register H with 34h and Register L with AB
 - B. Copy 32h in all the Registers
 - (c) Write an assembly language program to clear all 8 bit register A,B,C,D,E,H and L. [4]

OR

- (a) Write an assembly language program to generate continuous square wave with a period of 400us. Assume the system clock period is 325.5ns and use bit D0 to output for the square wave. [8]
- (b) Write an assembly language program for exchange the content of memory location C000h and C001h. [4]
- (c) Write an assembly language program to add the content of memory location C000h, C001h and store the result at memory locations C040h and C041H. [4]