

## **MICROPROCESSOR AND INTERFACING (3160712)**

### **ASSIGNMENT 1**

Q-1: Explain system bus of 8085 microprocessor.

Q-2: Explain following pins of an 8085 microprocessor in brief:

1. ALE 2. TRAP 3. READY 4. HLDA

Q-3: Explain 8085 Programming Model and Flag Register.

Q-4: Discuss various types of addressing modes of 8085.

Q-5: What are the advantages of an assembly language in comparison with high level languages?

Q-6: Draw and explain the block diagram of a microprocessor 8085 Architecture.

Q-7: Explain the flag register in 8085 microprocessor.

Q-8: Explain the following pins of 8085:

(1) INTR (2) HOLD (3) SOD (4) READY

Q-9: Differentiate 8085 microprocessor with 8086 microprocessor.

Q-10: Draw the timing diagram of MOV M, D instruction of an 8085 microprocessor.

Q-11: Write an 8085 assembly language program to arrange the following numbers in ascending order: 29H, 47H, 06H, 03H, 17H.

Q-12: Write an 8085 assembly language program to arrange the following numbers in descending order: 29H, 47H, 06H, 03H, 17H.

Q-13: How does the microprocessor differentiate among a positive number, negative number and a bit pattern?

Q-14: LOOP: LXI H, 1234H

DCX H

JNZ LOOP

Find out the mistake(s) in the above program and write the correct program so that it does not become infinite loop.

Q-15:

TUBE LIGHT	PC	POWER BANK	LAPTOP	LAMP	I-PAD	FAN	AC
Assume that above electronic items are plugged in single electric board.							

Here switch S7, S6, S5, S4, S3, S2, S1 and S0 are connected to the data line D7, D6, D5, D4, D3, D2, D1 and D0 respectively. When all the switches are **OFF**, the microprocessor reads the data **FFH** (for all switches **ON** the data will be **00H**). Initially all the switches are **ON**.

Write assembly language program for the following scenarios:

1. **Krunal** prefer to do work in night only if **AC**, **LAMP** and **LAPTOP** are **ON**.
2. **Chirag** never use **I-PAD** if **PC** and **POWERBANK** are **ON**.
3. **Arkil** feels comfortable to work on **PC** if **AC** and **TUBE LIGHT** are **ON**.
4. **Avadh** never take concern of electricity bill and work only if **POWER BANK** and **LAMP** are **OFF**.
5. In day time we prefer to do work with availability of **FAN** and **PC**.

Q-16: Write an assembly language program to provide the given ON/OFF time to traffic lights (Red, Green, and Yellow) and two pedestrian signs (Walk and Don't Walk). The signal lights are turned ON/OFF by the data bits of PORT1 and gives output as shown below,

No	Light	Data Bits	On Time
1	Red	D1	40 Seconds
2	Green	D3	30 Seconds
3	Yellow	D5	10 Seconds
4	Walk	D6	30 Seconds
5	Don't Walk	D7	50 Seconds

The traffic and pedestrian flows are in the same direction; the pedestrians should cross the road when the Green light is ON. Also write Delay subroutine to generate appropriate delay. Assume to turn ON Light, a "0" logic level required at corresponding data bits of the output port.

Q-17: Explain the following instructions

1. LHL D
2. RAL
3. DAA

Q-18: Explain demultiplexing of data and address bus of 8085.

Q-19: Explain the timing diagram of the instruction MOV C,A (4FH ) stored in location 2005H is being fetched. Define T-state, Machine cycle and Instruction cycle.

Q-20: Explain interfacing of 4KB EPROM with 8085 using decoder and gates as required. Assume starting address as 0000H.

Q-21: Explain subroutine with suitable example.

Q-22: Explain following instructions with no. of bytes, machine cycles and T-states required for execution: 1. SHLD 2. RAL

Q-23: Ten 8-bit values are stored from memory location 5000H onwards. Write an 8085 assembly language program to add POSITIVE values on addresses starts from 5100H and NEGATIVE values on addresses starts from 5200H.

Q-24: What are the states of the Auxiliary Carry (AC), Carry (CY), sign(S) and parity (P) flags after executing the following 8085 program?

```
MVI L, 5DH
MVI A, 6BH
ADD L
```

Q-25: Explain 8085 Programming model and classify instruction set on the basis of different addressing modes.

Q-26: 2100      LXI H, 1234H  
                 MVI A, 55H  
                 ADD M

What is the size of ADD M instruction? Name the machine cycles. Draw machine cycle and T-state diagram and specify the content of address bus, data bus and control signals \*RD, \*WR, IO/\*M and ALE signals and status signals S1 and S0 for every T states of ADD M instruction only.

Q-27: Write a program to find 2's complement of a number stored at 2050H and store result at 2055H.

Q-28: Compare memory mapped I/O and I/O mapped I/O.

Q-29: What are interrupts? List and explain the interrupt available in microprocessor 8085?

Q-30: What is interrupt? List hardware interrupts of 8085.

Q-31: Explain following instructions with no. of bytes, machine cycles and T-states required for execution: 1. CALL 2. CPI

Q-32: Ten 8-bit values are stored from memory location 3000H onwards. Write an 8085 assembly language program to find the largest value and stored it on the location 4000H.

Q-33: What are the states of the Auxiliary Carry (AC), Carry (CY), sign(S) and parity (P) flags after executing the following 8085 program?

```
MVI A, A9H
MVI B, 57H
ADD B
ORA A
```

Q-34: Explain One byte, Two byte, Three byte and write short note on different types of instruction sets.

Q-35: Specify the addressing mode, required Machine cycles, T-States and function for following instructions :

1. MVI M, 45H
2. RAL
3. LHLD 2300H

Q-36: Draw and explain timing diagram of STA instruction.

## **ASSIGNMENT 2**

Q-1: State the difference between PUSH and POP instruction.

Q-2: Explain the generation of control signals in 8085.

Q-3: Draw the internal block diagram of 8259A and explain the functions of each block in detail.

Q-4: What will be the value in accumulator, for the given 8085 program below?

MVI C, 7FH

MVI B, 3EH

MOV A, B

RLC

RLC

ANI 7FH

HLT

Q-5: Consider the following 8085 assembly language instructions:

LXI D, 1234H

NEXT: DCX D

MOV A, E

ORA D

JNZ NEXT

What amount of delay is generated if the crystal frequency is 4 MHz?

Q-6: Difference between RLC and RAL instruction.

Q-7: Differentiate between maskable and non-maskable interrupts.

Q-8: What is a flag Register? Enlist and explain various types of flags.

Q-9: Explain Machine level language and Assembly level language with examples.

Q-10: Explain 8085 bus organization.

Q-11: Write a program to count continuously in hexadecimal from FFH to 00H in a system with a clock period of 0.5  $\mu$ s. Use register C to set up 1 millisecond delay between each count and display the number at the output port1.

Q-12: What will be the value in accumulator, for the given 8085 program below?

```
MVI A, 07H
RLC
MOV B,A
RLC
RLC
RLC
ORA B
HLT
```

Q-13: Write an 8085 assembly language program to convert a two-digit BCD number into its equivalent hexadecimal number.

Q-14: Define the followings: Machine Cycle, T-state, JC, CMP, RET, SBB, STC

Q-15: Difference between RRC and RAR instruction.

Q-16: What is vectored and non-vectored interrupts?

Q-17 : Describe the functions of

- (1) READY PIN
- (2) ALE
- (3) HOLD
- (4) X1 and X2
- (5) SID and SOD
- (6) IO/M  $\overline{22}$ .
- (7) HLDA

Q-18: How many memory locations can be addressed by microprocessor with 14 address lines? Also specify how many address lines are required for 2KB memory.

Q-19: Load the hexadecimal numbers 56H and A9H in registers D and E respectively and add them. If sum is greater than FFH, display 01H at output PORT0; otherwise display sum.

Q-20: Draw the internal block diagram of 8255 and explain the functions of each block in details.

Q-21: Explain format of the descriptor in 80386 with diagram

Q-22: Draw block diagram of 80286 microprocessor.

Q-23: List features of 80386 microprocessor.

Q-24: Draw block diagram of SUN SPARC architecture.

Q-25: Explain the internal Block diagram of 8259A.

Q-26: Explain the given pins of 8086.

1. ALE 2. DEN 3.MN/MX

Q-27: Explain the modes of operation of 8086 microprocessor.

Q-28: Explain the block diagram of 8086 microprocessor

Q-29: List and explain the segment registers of 8086 microprocessor.

Q-30: Draw block diagram of 80386 microprocessor.

Q-31: Draw and explain the block diagram of the programmable interrupt controller 8259A.

Q-32: List features of 80486 microprocessor.

Q-33: Draw logical block diagram of ARM 7 architecture.

Q-34: Explain the internal Block diagram of 8255A.

Q-35: Draw and explain timing diagram of CALL and RET instruction.