Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI(NEW) EXAMINATION – WINTER 2022

Subject Code:3160712 Date:14-12-2022

Subject Name:Microprocessor and Interfacing

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Discuss various types of addressing modes of 8085.	**03**
	(b)	What are the advantages of an assembly language in comparison with high level languages?	**04**
	(c)	Draw and explain the block diagram of a microprocessor 8085.	**07**
Q.2	**(a)**	How does the microprocessor differentiate among a positive number, negative number and a bit pattern?	**03**
	(b)	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.	**04**
	(c)		**07**

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**.

OR

	(c)	Write an assembly language program to provide the given ON/OFF time to traffic lights (Red, Green, and Yellow) and two pedestrian signs (Walk	**07**

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 pedestrian 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.3 **(a)** What are the states of the Auxiliary Carry (AC), Carry (CY), sign(S) and parity (P) flags after executing the following 8085 program? **03**

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

(b) Explain 8085 Programming model and classify instruction set on the basis of different addressing modes. **04**

(c) 2100 LXI H, 1234H **07**
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.

OR

Q.3 **(a)** What are the states of the Auxiliary Carry (AC), Carry (CY), sign(S) and parity (P) flags after executing the following 8085 program? **03**

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

(b) Explain One byte, Two byte, Three byte and write short note on different types of instruction sets. **04**

(c) Specify the addressing mode, required Machine cycles, T-States and function for following instructions : **07**

```
MVI M, 45H
RAL
LHLD 2300H
```

Q.4 **(a)** Difference between RLC and RAL instruction. **03**

(b) Differentiate between maskable and non-maskable interrupts. **04**

(c) What is a flag Register? Enlist and explain various types of flags. **07**

OR

Q.4 **(a)** Difference between RRC and RAR instruction. **03**

	(b)	What is vectored and non-vectored interrupts?	**04**
	(c)	Describe the functions of (1) READY PIN (2) ALE (3) HOLD (4) X1 and X2 (5) SID and SOD (6) IO/M 22. (7) HLDA	**07**
Q.5	**(a)**	List features of 80386 microprocessor.	**03**
	(b)	Draw block diagram of SUN SPARC architecture.	**04**
	(c)	Explain the internal Block diagram of 8259A.	**07**
		OR	
Q.5	**(a)**	List features of 80486 microprocessor.	**03**
	(b)	Draw logical block diagram of ARM 7 architecture.	**04**
	(c)	Explain the internal Block diagram of 8255A.	**07**

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