Exam.Code:0927
Sub. Code: 33643

2076

B.E. (Electronics & Comm. Engineering)

Third Semester

EC-304: Microprocessor and Microcontrollers

Time allowed: 3 Hours Max. Marks: 50

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

*x-x-x*

1. Attempt the following:-
   a) List out the five categories of the 8085 instructions. Give example of the instructions for each group?
   b) Why must TRAP be both level-triggered and edge-triggered? Give a scenario where this dual triggering is essential.
   c) What happens when HLT instruction is executed in processor?
   d) Differentiate between hard real-time and soft real-time systems.
   e) How much on-chip RAM is available on 8051? Explain the instructions used to access the external RAM. (5x2)

## UNIT - I

2. a) Explain the architecture of the 8085 microprocessor with a neat block diagram. (5)
   b) Specify the register contents & flag status after each instruction, as the following instructions are executed in sequence.

| A | C | S | Z | CY | | |
|---|---|---|---|---|---|---|
| XX | | XX | 0 | 0 | 0 | initial contents |

```
MVI A, 25H
ADI A2H
MOV C, A
HLT
```

(5)

P.T.O.

3. a) A string of data bytes is stored starting from memory location 2050H. The end of the string is indicated by the data byte 00H. Write a program to add the bytes and store the result in the 2050 (sum) and 2051 (carry). Assume Data (H): 12,00,00,40,98,00. (5)

   b) Why are subroutines preferred over repeating code? Write a program using subroutines to perform multiple arithmetic operations on two numbers. (5)

4. a) Explain the importance of T-state calculation while generating an accurate rectangular wave using 8085 timing. (5)

   b) During an INTR interrupt, the microprocessor waits for INTA. What happens if the external device does not supply an opcode? (5)

## UNIT - II

5. a) Differentiate between microprocessor-based and microcontroller-based embedded systems.

   b) Draw and explain the pin diagram of 8051. (2x5)

6. a) Write an 8051 program to transfer a block of data from one memory location to another.

   b) Write an 8051 assembly program to generate a square wave on a port pin using Timer 0 in mode1. (2x5)

7. a) Explain the memory organization of 8051 (internal RAM, ROM, SFRs).

   b) Explain how to interface an LCD with 8051. (2x5)

*x-x-x*