# Microprocessor & Microcontroller System
## (New) (1040)

P. Pages : 3

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :
1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory. Attempt **any two** from each unit.
5. Figures to the right indicates full marks.
6. Assume suitable data if necessary.
7. Use of non-programmable calculator is allowed.

## UNIT - I

1. a) Explain following 8085 instructions, with the help of suitable illustrative example. **10**

   i) STAX H                    ii) RST 5

   iii) CMP M                   iv) XTHL

   v) JP Here

   b) Explain : **10**

   i) Flag Register of 8085.

   ii) Demultiplexing of adress / Data bus.

   c) Write a program using 8085 instructions. Which is used to multiply two unsigned 8 - bit Numbers. Multiplicand is stored at 2000H and Multiplier at 2001 H. Store the result of multiplication at 2002 H and 2003 H locations. **10**

## UNIT - II

2. a) Explain : **10**

   i) Internal RAM organization of 8051.

   ii) Data moves instructions with External Program / Code Memory.

b) Explain : **10**

i) Dual functions of Port - 3 pins.

ii) Write a program using 8051 instructions to load accumulator with value ADH, and complement the accumulator 500 times store the result in external Data memory at 2000H.

c) Write assembly language program of 8051, to add ten bytes stored in external RAM. Assume that the bytes are stored from 9000H on wards and the result of addition of bytes is a 16 bit. Store the result in Register

$R_5$ and $R_6$ of Register Bank - 3. Also draw the flow - chart. **10**

## UNIT - III

3. a) Explain : **10**

i) Interrupt priority structure of 8051 upon Reset & use of IP register.

ii) TCON register of 8051.

b) Write an assembly language program for 8051 for following requirement. **10**

i) To generate square wave of frequency 2kHz on port pin P2.5.

ii) Use Timer - 1 in mode - 1 Assume the frequency of crystal oscillator is 11.0592 MHz.

c) Write an assembly language program for serial transmission of message "MICROPROCESSOR & MICROCONTROLLER SYSTEM" continuously at a baud rate of 9600 [with crystal frequency of 11.0592 MHz] in a serial mode -1. **10**

## UNIT - IV

4. a) Explain : **10**

i) Control word format of 8255 PPI.

ii) Use of following pins of LCD.
   a) RS.
   b) R/W
   c) E

b) Write an assembly language program for the interfacing of a seven-segment LED Display shown in Fig. 1. **10**

    i) Display is of common - cathode type.

    ii) Use the L. S. B. Digit to continuously display value of 0 to 9.

    iii) Port P 2.0 used for digit selection & Port - 1 (1.0 to 1.7) used for sending seven segment code to display.
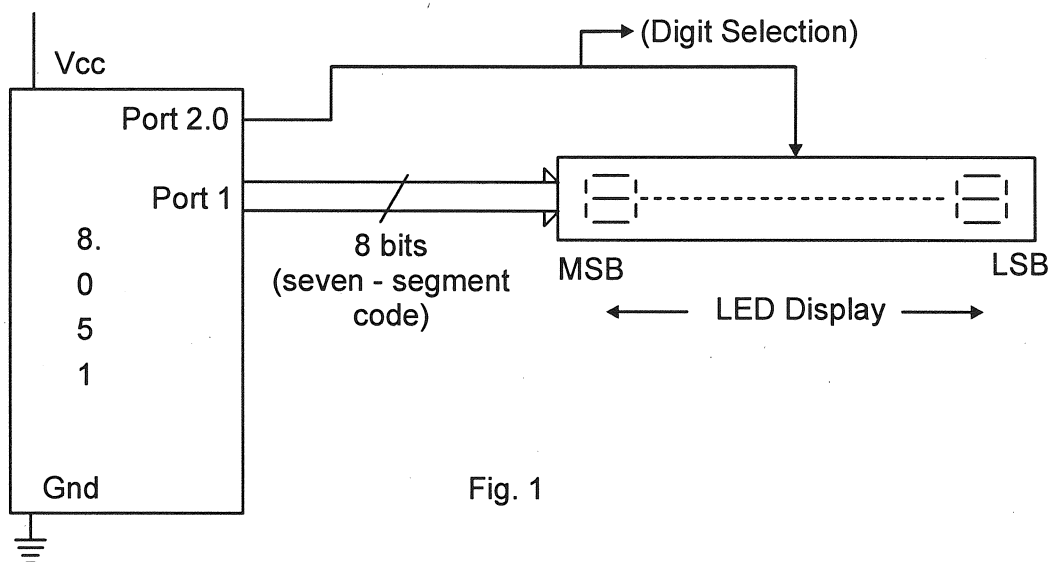
    iv) Delay between two digits display is optional.



Fig. 1

c) Draw and explain block schematic of following system configuration of 8051. **10**
    i) 16 K byte external program [code] memory ROM starting at 0000H.
    ii) 16 K byte external data memory RAM starting at 8000H.
    Use 74LS138 for the address decoding.

## UNIT - V

5. a) List the features of $I^2C$ – Bus. What are different modes of $I^2C$ – Bus ? Explain any one of them in detail ? **10**

   b) Explain how data transmission and reception take place using RS - 232C ? **10**

   c) Explain : **10**
    i) Features of PIC microcontroller.
    ii) Control register of RTC - DS 1307.

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