B.E. (EE) Part-Ill 6th Semester Examination, 2010

Microprocessor and Interfacing

(EE-605)

Time : 3 hours   Full Marks : 70

Use separate answerscript for each half.
Answer O.No.6 and any FIVE questions, taking THREE from each half.
Two marks are reserved for neatness in each half.

FIRST HALF

1. a)   Find the sum of
    (i)   1011 and 0101 (Binary),
    (ii)   64 and 29 (BCD),
    (iii) C2 and 4E (Hex.),
    (iv) 35 and 27 (Octal).

    b)   Use two's complement arithmetic to find the difference of 55(D) and 36(D).

    c)   Express -75(H) in signed binary form.

    d)   Find the hexadecimal equivalent of 30.625 in the normalized short real format.

    e)   Write one 8085 assembly language instruction each to set and reset the carry flag.   [4+2+l+2+2|

2. a)   What is a data transfer instruction? Give two examples.

    b)   What function is performed by the following 8085 instructions?
    (i)DAA;   (ii)DCRL;   (iii)LDAXB;   (iv) PCHL.

    c)   What is meant by 'DAD' and what are the flags affected by this instructions?

    d)   Write an assembly language program which checks to see if the number in memory location 2000**H** is even or odd and returns a *0* in B register if it is odd; otherwise returns a T.   12+4+2+31

3. a)   What will be the value in Accumulator, for the given 8085 program below (show the contents of the registers at each step):
    2000 : MVI C, 7F H
    2002 : MVI B, 3E H
    2004 : MOVA.B
    2005 : RLC
    2006 : RLC
    2007 : AN I 7F H
    2009 : HLT

b) Write an 8085 assembly language program to fill a block of 50_H, bytes starting at address 9000_H with character $2B_H$.

c) What is stack? With a suitable example, explain the role of stack and program counter when a subroutine CALL instruction is executed.

d) What is PSW? **[3+3+4+1]**

4. a) Differentiate between hardware interrupts and software interrupts of 8085.

b) What is the function of a SIM instruction?

c) What is the utility of PUSH and POP instructions?

d) Write an 8085 assembly language program to generate an interrupt every 0.5 second (assume 5 MHz. clock frequency) using any bit of PPI 8255.

[3+2+2+4]

5. a) Distinguish between 'cycle-stealing' and 'Interleaved' DMA.

b) With a simple block diagram, explain how a DMA controller services an external peripheral device. Highlight the important control signals.

c) What is Baud rate? What is its maximum value for asynchronous communication using 8251 A?

d) Distinguish between 'TXRDY' and 'TXEMPTY* signals of 8251 A.

e) What are the functions of the following instructions in 8051:
(i) ADD R2, 45H   (ii) MOV R5, #45 **[2+3+2+2+2]**

SECOND HALF

6. a) A_____is a functional block of the SRAM while a_____is a functional block of the DRAM.

b) The_____and_____pinouts are used for serial communication.

c) A_____converts audio signals to digital signals and vice versa.

d) The ADC 0809 is a_____analog-to-digital converter.

e) The 8253 programmable timer in Mode 0 operators as an_____which may be used to trigger the interrupts.

f) To check the integrity of digital signal transmission, a checking of the binary ones is done in the signal, through a process called_____.

g) The speed of data transmission is signified by a term called the_____.

[2+2+1+2+2+1+11

7. Design the interfacing of a microprocessor based instrument which will input voltage and current from the power circuit. Show the signal conditioning block if any, and other functional blocks. Handshaking signals are to be shown. u_x only block diagrams for the design. Also through a flowchart only show how the VI product is to be calculated. (U|

8. a) Give a schematic diagram of the 8085 Interrupt circuitry.

   b) A ROM has eight memory locations each 8-bit wide. The ROM is to be programmed by suitably placing diodes in the memory cell.
      Draw the functional representation of such a memory storing (i) FF_H in Reg. 7, (ii) 40_H in Reg.4, (iii) 88_H in RegO. [6+51

9. A 512 x 8 bit memory is to be configured using 256 x 4 bit RWM chips. The base address of the memory block is A400(Hex) in 8085 A address space. Design the memory interfacing circuit using suitable other chips as necessary. Show whether it is a case of particle or absolute decoding. [HI

10. Write short notes on <u>any two</u> :   [5!4x2|
    a) The timing diagrams of an instruction cycle,
    b) The timing diagrams of the 8253 in Mode 1,
    c) The bus highway of the 8085 microprocessor.