MICROPROCESSOR & MICROCONTROLLER
(ELEC 3202)

Time Allotted : 3 hrs   **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and
<u>any 5 (five)</u> from Group B to E, taking <u>at least one</u> from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

    (i)   Which of the following interrupt has highest priority in INTEL 8085?
    (a) TRAP   (b) INTR
    (c) RST 6.5   (d) RST 5.5

    (ii)   The number of address lines required for a 8KB EPROM chip is
    (a) 11   (b) 13
    (c) 10   (d) 14

    (iii)   On power up, the 8051 uses which RAM locations for register R0- R7
    (a) 08H-0FH   (b) 10H-17H
    (c) 00H-07H   (d) 18H-1FH

    (iv)   How many bytes of bit addressable memory is present in 8051 based microcontrollers?
    (a) 8 bytes   (b) 32 bytes
    (c) 128 bytes   (d) 16 bytes

    (v)   How are the bits of the register PSW affected if we select Register Bank 2 of 8051?
    (a) PSW.3=0 and PSW.4=1   (b) PSW.5=0 and PSW.4=1
    (c) PSW.3=1 and PSW.4=1   (d) PSW.3=0 and PSW.4=1

    (vi)   The addressing mode used in the instruction HLT in INTEL 8085 is
    (a) Direct   (b) Immediate
    (c) Indirect   (d) Implicit

    (vii)   The instruction "JNC 16-bit" of 8085 microprocessor refers to jump to 16 bit address if
    (a) Sign flag is set   (b) Zero flag is set
    (c) CY flag is reset   (d) parity flag is reset

(viii) Which of the following instruction will add the accumulator content with the content of register R0 of 8051 microcontroller?
(a) ADD @R0,A
(b) ADD A,@R0
(c) ADD R0,@A
(d) ADD A,R0

(ix) The timers in Mode 1 of 8051 microcontroller overflow when the register reaches
(a) $FFFF^H$
(b) $1FFF^H$
(c) $11FF^H$
(d) FF^H

(x) Which of the following instructions will copy the contents of RAM whose address is in register R0 to port 3?
(a) MOV P3, @R0
(b) MOV@P3, R0
(c) MOV @R0, P3
(d) MOV P3, R0

Group – B

2. (a) Discuss about the following related to Intel 8085 microprocessor:
(i) Program counter   (ii) Arithmetic & Logic Unit (ALU).

(b) Write a short note on 8085 bus structure.

(c) Draw the timing diagram of MOV A,B .

4 + 4 + 4 = 12

3. (a) Identify the status of (i) Sign , (ii) Zero, (iii) Auxiliary Carry, (iv) Carry, (v) Parity flags and (vi) Accumulator contents after execution of the following program for Intel 8085 microprocessor.
MVI A, $E5^H$
XRA A
HLT

(b) Develop a delay subroutine for delay time 1 ms in a 3 MHz microcomputer system. Show the proper calculations.

(c) Write an Assembly Language Program to obtain the largest number from a set of ten 8-bit numbers which are stored in ten consecutive memory locations starting from $F200^H$. The largest number is to be stored in $F300^H$.

4 + 4 + 4 = 12

Group – C

4. (a) Interface two 6116 ICs (2 K x 8 RAM) with the 8085 using 74LS138 decoder such that the starting addresses assigned to them are 8000^H and 9000^H respectively.

(b) Discuss the function of instruction SIM. Draw the accumulator bit pattern for execution of instruction SIM and explain the function of each bit.

6 + 6 = 12

5. (a) Write a BSR control word subroutine to set bits PC5 and PC3 of 8255 and reset them after 30ms. Assume that 30ms delay subroutine is available and address of 8255 CWR is 83H.

   (b) Illustrate the control word format of 8255A for I/O mode and BSR mode.

   4 + (4 + 4) = 12

Group – D

6. (a) Briefly discuss the features of INTEL 8051 microcontroller.

   (b) Explain the first 128 bytes (zone 1) of internal RAM of Intel 8051 microcontroller.

   6 + 6 = 12

7. (a) Explain the following 8051 microcontroller instructions:
   (i) DA A
   (ii) SJMP rel-addr
   (iii) MOV A, @R1.

   (b) Describe TMOD register of 8051 microcontroller.

   (c) Write an 8051 based assembly language program to generate a square wave of 50% duty cycle of frequency 10 kHz through the pin P1.2 while considering the crystal frequency as 11.0592 MHz.

   3 + 3 + 6 = 12

Group – E

8. (a) Draw the interfacing circuit of 8051 microcontroller with 16×2 LCD and explain properly.

   (b) Write an Assembly Language Program to display 'ELECTION' in the LCD of above circuit.

   6 + 6 = 12

9. (a) Draw and describe the interfacing connection of ADC0804 with 8051 microcontroller.

   (b) Write an Assembly Language Program to read analog input and send the converted digital output to port 1 continuously.

   6 + 6 = 12

Department & Section	Submission Link
EE	https://classroom.google.com/c/MzAwMzI3MDU5NjY5/a/MzYwMDQ2MDU5Mzg3/details