**M.Sc. ELECTRONICS**
**Third Semester**
**Microprocessor and Microcontroller**
**(MSE - 11)**

**Duration: 3Hrs.**                                      **Full Marks: 70**

Part-A (Objective) =20
Part-B (Descriptive)=50

**(PART-B: Descriptive)**

**Duration: 2 hrs. 40 mins.**                          **Marks: 50**

## 1. Answer *any five* from the following:                    2×5=10

*(a)* Calculate the address lines required for an 4K- byte memory chip.

*(b)* Write the similarities and differences of CALL and RET to the PUSH and POP instructions of 8085.

*(c)* Explain the function of ALE signal of 8085 µP with necessary illustrating diagram.

*(d)* What is Microprocessor? What is the difference between a microprocessor and a microcontroller?

*(e)* Explain the differences of RET and RETI instruction.

*(f)* Define logic levels of RS 232 standard.

*(g)* What is bus? What are the different buses of Intel 8085?

## Answer *any five* from the following:                      3×5=15

*(a)* What is flag? Draw the flag register of Intel 8086 microprocessor.

*(b)* Specify the contents of the registers and the flag status as the following instructions are executed.

| MVI A, 00H | A | B | C | D | S | Z | CY |
|------------|---|---|---|---|---|---|----|

MVI B, F8H

MOV C, A

MOV D, B

HLT

*(c)* Define instruction cycle, machine cycle and T state of a microprocessor.

*(d)* Explain the significance of each bit of 8255 control register.

*(e)* Describe the operations performed by RLC and RAL instructions of 8085

*(f)* Explain the significance of each bit of 8051 flag register.

*(g)* Write short notes on (any one)
      i. USART 8251A     ii. I/O Ports of 8255

## 3. Answer *any five* from the following:

*(a)* Explain the features of RISC and CISC processor. Give examples.   **5**

*(b)* Briefly describe about the register organization of microprocessor 8086. **5**

*(c)* How to initialise an 8051 port as an output port? Explain with necessary schematic.   **5**

*(d)* Write a program for 8085 to
   i) Clear the accumulator,      ii) Add 47H,
   iii) Subtract 92H,      iv) Add 64H,
   v) Display the result at memory locations 8000H and 8050H after subtracting 92H and after adding 64H respectively.   **5**

*(e)* What is the difference between INTR and other vectored interrupts of 8085 microprocessor? Explain how INTR works.   **2+3=5**

*(f)* **Write short note on *any one* of the following:**   **5**
   (i) 8255     (ii) 8251     (iii) 8279

*g)* Describe the interrupts of Intel 8085.

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## Microprocessor and Microcontroller
## (MSE - 11)

*(The figures in the margin indicate full marks for the questions)*

**Duration: 20 minutes**                                **Marks – 20**

### PART A- Objective Type

**1. Answer all questions:**                                **1×20=20**

(i) A digital computer in which a microprocessor performs the functions of a CPU is known as a

   a) microcomputer                     b) macro computer

   c) super computer                    d) server

(ii) In a 8085 microprocessor system with memory mapped I/O,

   a) I/O devices have 8 bit addresses

   b) I/O devices are accessed using IN and OUT instructions

   c) There can be a maximum of 256 input devices and 256 output devices

   d) Arithmetic and logic operations can be directly performed with the I/O data

(iii) In a microprocessor, the register which holds the address of the next instruction to be fetched is

   a) Accumulator

   b) Program Counter

   c) Stack Pointer

   d) Instruction register

(iv) After execution of the instruction MVI A,00h

   a) Zero flag will be 1

   b) Carry flag will be 1

   c) Zero flag will be 0

   d) No flags will be affected

(v) Which one of the following is not a vectored interrupt?

   a) TRAP

   b) INTR

   c) RST7.5

   d) RST3

(vi)    MVI A, 10H
MVI B, 10H
BACK NOP
ADD B
RLC
JNC BACK
HLT

The number of times that the operation NOP will be executed is
- a) 1
- b) 2
- c) 3
- d) 4

(vii) One example of direct addressing instruction is
- a) MVI B,15h
- b) MOV A,C
- c) IN 01h
- d) ADD M

(viii) The stack and stack pointer
- a) Both reside in memory
- b) Both reside in CPU
- c) The former resides in memory, but the latter in CPU
- d) The former resides in CPU, but the latter in memory

(ix) 8085 microprocessor has a flag register. The following flags are there, keep them in the ascending order starting from LSB to MSB
1. Parity flag
2. Zero flag
3. Carry flag
4. Sign flag
- a) 1,2,3 and 4
- b) 2,4,1 and 3
- c) 3,2,1 and 4
- d) 3,1,2 and 4

(x) After execution of the instruction DAD B, the result will be stored in
- a) Accumulator
- b) BC register pair
- c) DE register pair
- d) HL register pair

(xi) Operation of LDAX D is
- a) Copies the contents of the register D into the Accumulator
- b) Copies the contents of the Accumulator into the register D
- c) Copies the contents of the memory location pointed by the D register pair into the Accumulator
- d) Copies the contents of the Accumulator into the memory location pointed by the D register pair

(xii) 8279 is used for
- a) Keyboard/display interface
- b) I/O interfacing
- c) Timer
- d) None of the above

(xiii) If D7 bit of the control word of 8255 is 1 then
   a) BSR mode will be selected
   b) Simple I/O mode will be selected
   c) Handshake I/O mode will be selected
   d) mode selection will not be affected

(xiv) BSR mode is connected only with
   a) the eight bits of the port C
   b) the lower 4 bits of the port C
   c) the eight bits of the port B
   d) the eight bits of the port A

(xv) Correct order of priority of the Interrupts of Intel 8085 is

   a) TRAP, INTR, RST 7.5, RST 6.5 RST 5.5          b) TRAP, RST 5.5, RST 6.5, RST 7.5, INTR

   c) INTR, RST 7.5, RST 6.5, RST 7.5, TRAP          d) INTR, RST 5.5, RST 6.5, RST 7.5, TRAP.

The content of the register B is
   a) 20h
   b) 0Fh
   c) FFh
   d) 00h

(xvi) What is the size of the SP register of 8051 microcontroller?
   a) 16 bit
   b) 12 bit
   c) 8 bit
   d) 4 bit

(xvii) Advantage in using the EQU directive to define a constant value is
   a. Easy to define
   b. No other options to define a constant
   c. If the value is to be changed later , it can be done in one place instead of at every occurrence
   d. Can be used many times in a program

(xviii) The machine cycle for a crystal frequency of 12 MHz for 8051 is
   a) 0.5 us
   b) 1 us
   c) 2us
   d) 6 us

(xix) Which 8051 ports need pull-up resistors to function as an I/O port?
   a) Port0
   b) Port1
   c) Port2
   d) Port3

(xx) The microcontroller 8051 has on-chip ROM of
   a) 4kB          b) 128 byte          c) 0 kB          d) 2kB

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