M.Sc. ELECTRONICS
THIRD SEMESTER
MICROPROCESSOR & MICROCONTROLLER
MSE-301

(Use separate answer scripts for Objective & Descriptive)

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

[PART-A : Objective]

Time : 20 min. **Marks : 20**

Choose the correct answer from the following: ***1X20=20***

1. An alternate function of port pin P3.4 in the 8051 is:
   a. Timer 1 b. Timer 0
   c. Interrupt 1 d. Interrupt 0

2. How many machine cycles are required for execution of LDA 7532 H?
   a. 3 b. 4
   c. 5 d. 6

3. Which one of the following 8085 instruction may be used to clear the accumulator content irrespective of its initial value?
   a. ADD A b. XRA A
   c. SUB A d. ANA A

4. How many 16-bit special purpose registers are present in 8085 microprocessor?
   a. 16 b. 8
   c. 6 d. 2

5. A number of 1-bit registers used in microprocessors to indicate certain conditions are usually referred to as:
   a. Shift registers b. Flags
   c. Latches d. Counters

6. Which of the following lists the interrupt is in decreasing order of priority?
   a. TRAP, RST 5.5, RST 6.5, RST 7.5, INTR b. TRAP, RST 7.5, RST 6.5, RST 5.5, INTR
   c. INTR, TRAP, RST 7.5, RST 6.5, RST 5.5 d. RST 7.5, RST 6.5, RST 5.5, TRAP, INTR

7. The software used to drive microprocessor based systems is called:
   a. Assembly language b. Firmware
   c. Machine language d. BASIC

8. The addressing mode in instruction XRI 05H is:
   a. Direct b. Register indirect
   c. Register d. Immediate

9. The register in 8085 that is used to keep track of the memory address of the next op-code to be run in the program is:
   a. Stack pointer b. Program counter
   c. Accumulator d. Instruction pointer

10. The Intel 8086 is..... bit processor.
    a. 8 b. 16
    c. 32 d. 64

11. The BIU contains FIFO register of size..... bytes.
    a. 8 b. 6
    c. 4 d. 12

12. Both the operands source and destination of an instruction cannot be:
    a. Register, register b. Memory location, memory location
    c. Immediate data, register d. Memory location, register

13. If an interrupt is generated from outside the processor then it is an:
    a. Internal interrupt b. External interrupt
    c. Interrupt d. Software interrupt

14. A single instruction to clear the lower nibble of accumulator in 8085 language assembly is:
    a. XRI 0FH b. ANI F0H
    c. XRI FOH d. ANI 0FH

15. The stack of 8086 is accessed using:
    a. SP register b. SP and SS register
    c. SS register d. None

16. The internal RAM of the 8051 microcontroller is:
    a. 32 bytes b. 64 bytes
    c. 256 bytes d. 128 bytes

17. An 8-bit microprocessor can have..... address lines.
    a. 8 b. 16
    c. 32 d. 42

18. The first machine cycle of an instruction is always:
    a. A memory read cycle b. A fetch cycle
    c. An I/O read cycle d. A memory write cycle

19. The instruction MOV BX,[2500H] is an example of:
    a. Immediate addressing mode b. Direct addressing mode
    c. Indirect addressing mode d. Based indexed addressing mode

20. 8085 microprocessor has how many pins?
    a. 20 b. 30
    c. 40 d. 50

= = * * = =

(PART-B :Descriptive)

Time: 2 hrs. 40min. **Marks: 50**

[Answer question no.1 & any four (4) from the rest]

1. Explain the function of various flags of 8086 microprocessor. 10

2. a. Briefly describe the interrupt system of 8085 microprocessor. 5+5=10
   b. Discuss the bit pattern of the accumulator for SIM instruction.

3. a. Explain the requirement of a program counter, a stack pointer and ALE in the architecture of 8085. 3+7=10
   b. Describe the functional units present in 8086, with a neat diagram of 8086 microprocessor architecture.

4. a. Define the different addressing modes of 8086 with examples. 7+3=10
   b. Determine the physical address of each segment located by following segment register values, if the offset address is E200H: CS=0345H, DS=3500H, ES=0550H.

5. a. Write an 8085 assembly language program to add two 8-bit numbers, the sum may be of 16-bits. 5+5=10
   b. Write an 8085 assembly language program to multiply two 8-bit numbers stored in memory 7200H and 7201H; and save the result in memory 7300H.

6. a. Calculate the time delay for the following set of instructions having a 0.5 μs clock period. 6+4=10

```
        MVI B, FFH
LOOP2:  DCR B
        MVI C, 8CH
LOOP1:  DCR C
        JNZ LOOP1
        MOV A, B
        OUT P1
        JMP LOOP2
```

   b. Write a program to create a time delay of 2ms with 1μs clock period.

7. Recognize the machine cycles for the instruction LXI 7500H. Draw the timing diagram. 10

8. Explain the architecture of 8051 microcontroller with a neat diagram. 10

= = *** = =