

Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.TECH (ECE)/SEM-5/EI (EC)-502/2011-12**

**2011**

**MICROPROCESSOR & MICROCONTROLLER**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

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

**GROUP - A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

i) The instruction XCHG exchanges the contents of

- a) ACC and HL pair
- b) BC pair and HL pair
- c) DE pair and HL pair
- d) HL pair and memory location.

ii) Machine cycles for 1 N instruction are

- |      |      |
|------|------|
| a) 6 | b) 5 |
| c) 4 | d) 3 |

- iii) RST 7.5 interrupt is
  - a) Vectored and Maskable
  - b) Non-vectored and Maskable
  - c) Non-vectored and Non-maskable
  - d) Vectored and Non-maskable.
- iv) When a subroutine is called the address of the instruction next to CALL is saved in
  - a) Stack pointer
  - b) Program Counter
  - c) Stack
  - d) Combination of flag and AX register.
- v) Which is the BSR control word to set PC4 ?
  - a) 09 H
  - b) 07 H
  - c) 04 H
  - d) 05 H.
- vi) An  $8\text{ K} \times 8$  ROM, holding the monitor program in a microprocessor trainer kit has the end address.
  - a) 8000 H
  - b) 4000 H
  - c) 1 FFF H.
  - d) 3 FFF H.
- vii) What will be the content of the accumulator and the status of CY flag after RLC operation, if the content of the accumulator is 'BCH and CY is 0 ?
  - a) 79 H, 1
  - b) 78 H, 1
  - c) 5E H, 0
  - d) 5D H, 0
- viii) How many address lines are there in 8086 microprocessor ?
  - a) 16
  - b) 8
  - c) 20
  - d) 12.
- ix) The total I/O space available in 8085 if used peripheral mapped I/O.
  - a) 64
  - b) 128
  - c) 256
  - d) 512.

- x) 8251 is a
- a) USART IC                                  b) Counter  
c) interrupt controller                  d) none of these.
- xi) If the crystal with 8085 is 2 MHz, the time required to execute an instruction of 20 T states is
- a) 20  $\mu$ S    b) 10  $\mu$ S  
c) 40  $\mu$ S    d) 5  $\mu$ S.
- xii) A single instruction to clear the lower four bits of the accumulator in 8085 microprocessor is
- a) XRI OF H    b) ANI FO H  
c) ANI OF H    d) XRI FO H.

**GROUP - B**

**( Short Answer Type Questions )**

Answer any *three* of the following.                                  3 × 5 = 15

2. Describe the addressing modes of 8085.
3. a) What are the functions of ALE, HOLD and READY signals?                                  3  
b) Differentiate between I/O mapped I/O and memory mapped I/O.                                  2
4. Calculate the total time delay for the following loop in 8085 microprocessor, assuming the clock period is 0.5 microsecond.

L × I B, 238 HH	;	10 T
LOOP : DC × B	;	6 T
MOV A,C	;	4 T
ORA B	;	4 T
JNZ LOOP	;	10/7 T

5. a) Give the bit configuration of 8085 flag register. 2  
b) Write down the mode-0 control word of 8255 A for the following :  
PORT A = input, PORT B not used,  
PORT C ( upper ) = input, PORT C ( lower ) = output. 3
6. Draw the timing diagram of Memory Read machine cycle of 8085 microprocessor.

### GROUP - C

#### ( Long Answer Type Questions )

Answer any *three* of the following.  $3 \times 15 = 45$

7. a) What are vectored and non-vectored interrupts ? Explain the instructions RIM and SIM. Write an instruction to enable the RST 7.5, RST 6.5 and disable RST 5.5. 5  
b) Discuss how 8253 is used to generate square waves. 5  
c) What is the difference between CALL and JMP instructions of 8085 microprocessor ? 5
8. a) Describe the different addressing modes of 8086 microprocessor. 6  
b) What are the main functions performed by BIU and EU unit of 8086 microprocessor ? 5  
c) How is pipeline achieved in 8086 microprocessor ? 4
9. a) Discuss the memory organization of 8051 microcontroller. 5  
b) What are the different interrupts available in 8051 microcontroller ? 5  
c) Discuss the different addressing modes of 8051 microcontroller. 5
10. Discuss the hardware and software of any microprocessor based industrial application.
11. Write notes on any *three* of the following :  $3 \times 5$   
a) Synchronous mode of data transfer  
b) Serial mode of operation using 8085 microprocessor  
c) Interfacing memory with a microprocessor  
d) Designing I/O ports  
e) Interrupt service Subroutine.