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Paper Code : EC-502

PUID : 05051 (To be mentioned in the main answer script)

MICROPROCESSORS & MICROCONTROLLERS

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 : $10 \times 1 = 10$

   i) 8253 has how many modes of operation ?
   a) 6 b) 5
   c) 4 d) 3.

   ii) In 8051 microcontroller, which of the following is dedicated port ?
   a) Port 0 b) Port 1
   c) Port 2 d) Port 3.

   iii) The segment and offset address of the instruction to be executed by 8086 microprocessor are pointed by
   a) CS and SI b) DS and IP
   c) CS and SP d) CS and IP.

iv) The interfacing device used with an output port is
a) Buffer b) Latch
c) Priority Encoder d) None of these.

v) When a subroutine is called the address of the instruction next to CALL is saved ?
a) Stack pointer register
b) Program counter
c) Stack
d) Combination of flag and BC register.

vi) For 8255 PPI, the bidirectional mode of operation is supported in
a) Mode 1
b) Mode 2
c) Mode 0
d) either Mode 1 or Mode 2.

vii) The instruction MOV *A*, *B* belongs to
a) immediate addressing
b) directing addressing
c) implied addressing
d) register addressing.

viii) In 8085, TRAP is
a) always maskable
b) cannot interrupt a service sub-routine
c) used for temporary power failure
d) lowest priority interrupt.

ix) The vector address corresponding to software intterrupt command RST7 in 8085 microprocessor is
a) 0017 H b) 0027 H
c) 0038 H d) 0700 H.

x) The instruction : XCHG exchanged the contents of
a) Accumulator & H register
b) DE-pair & HL pair
c) BC-pair & HL pair
d) HL-pair & memory location.

xi) Whenever the PUSH instruction is executed the stack pointer is

a) Decremented by 1 b) Decremented by 2
c) Incremented by 1 d) Incremented by 2.

xii) The physical address when CS = 2345 H and IP = 1000 H is

a) 24450 H b) 23450 H
c) 12345 H d) 2345 H.

GROUP – B

(Short Answer Type Questions)

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

2. Describe different addressing modes of 8085.
3. Differentiate between Microprocessor and Microcontroller.
4. Write a program to calculate the sum of series of numbers. The length of the series is in memory location 8000 H and series itself starts from memory location 8001 H. The result of sum is stored in memory location 8500 H and carry is stored in memory location 8501 H.
5. What is interrupt ? Explain briefly about vectored and non-vectored interrupts of 8085. 2 + 3
6. Design a microprocessor system for the 8085 microprocessor such that it should contain 16 kB of EPROM & 4 kB of RAM using two 8 kB of EPROMs and two 2 kB of RAMs.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Draw timing diagram of instruction "9000 H STA 9500 H". Assume accumulator content is 32 H.

b) Write a main program and a conversion subroutine to convert the binary number stored at 6000 H into its equivalent BCD number. Store the result from memory location 6100 H.

c) Draw the diagram of interfacing of input and output device with the help of I/O mapped I/O technique. Assume that address of input port is 80 H and address of output port is 81 H. 5 + 5 + 5

8. a) Explain the format of flag register of 8086.
b) What are the advantages of having memory segmentation ?
c) How does 8086 support pipelining ?
d) What is purpose of queue in 8086 ? 4 + 5 + 3 + 3

9. a) What is the advantage of using 8253/8254 over delay subroutine ?
b) Explain the control word format for timer 8253/8254.
c) What are the different operating modes of 8253/8254 ? Explain briefly any two of operating modes with the help of timing diagram.
3 + 3 + (3 + 6)

10. a) Draw the block diagram of 8051 microcontroller.
b) Discuss the memory organization of 8051 microcontroller.
c) Discuss the different addressing modes of 8051 microcontroller. 5 + 5 + 5

11. Write short notes on any *three* of the following : 3 × 5
a) BSR operation of 8255
b) MIN mode & MAX mode
c) Generation of control signal using decoder IC
d) Demultiplexing of Address and Data bus using Latch IC.
e) PIC Microcontroller.