

Question Paper

Exam Date & Time: 28-Nov-2019 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES END SEMESTER THEORY EXAMINATION IV SEMESTER B.Sc. (Applied Sciences) in Engg. MICROPROCESSORS [ICS 241]

Marks: 100

Duration: 180 mins.

Answer 5 out of 8 questions.

- 1) Explain the 8086 minimum mode system with a neat sketch. (10)
 - A)
 - B) Describe the following 8086 assembler directives with an example for each. (5)
 - (i) EQU
 - (ii) ASSUME
 - (iii) DD
 - C) Compute the effective and physical addresses in each of the following cases. DS is used as the segment register and BX=0158, DI=10A5, Displacement=1B57, DS=2100. (5)
 - (I) Direct.
 - (ii) Register direct.
 - (iii) Register indirect assuming register BX.
 - (iv) Base index assuming registers BX and DI.
 - (v) Relative base index assuming registers BX and DI.
- 2) With a neat diagram, explain how 80286 computes physical address in segmentation mode. (6)
 - A)
 - B) Explain all the 8086 conditional flags with an example for each. (6)
 - C) Write an 8086 ALP that sorts an array of words in ascending order. (8)
- 3) Consider a string of lowercase characters declared in the data segment. (8)
 - A) Write a complete 8086 ALP that will replace each character in the input string based on the following conditions. Toggle the character if the character in the input string is a vowel. Otherwise, replace the character with its previous character in the alphabetical order.
 - B) Describe the following 8086 string instructions with an example for each. (5)
 - (i) MOVSW ii) CMPSB iii) SCASW (iv) LODSB (v) STOSB.
 - C) Describe the following pins of 80386. (7)
 - (i) BE0# to BE3# (ii) ADS# (iii) NA# (iv) BS16# (v) D/C#.

- 4) Write short notes on the following 8086 interrupt types. (6)
- A) (i) Type 0
(ii) Type 2
(iii) Type 4.
- B) List the series of actions that 8086 steps through while responding to an interrupt request. Also, explain the importance of interrupt vector table in 8086 interrupt response. (6)
- C) Write down the expects and returns for each of the following 8086 DOS interrupts. (8)
- (i) INT 21H, function code 3CH.
(ii) INT 21H, function code 40H.
(iii) INT 21H, function code 42H.
(iv) INT 21H, function code 3DH.
- 5) Discuss the internal architecture of 8086 with a neat diagram. (10)
- A)
- B) Draw the output timing diagram for 8086 minimum mode system. (5)
- C) Assume that 8259A operates in fixed-priority mode. The interrupt that is currently served is IR4. At this point, let us say an interrupt comes to IR2 pin. **STI is the first instruction in the interrupt service procedure.** How do 8259A respond? Explain with a neat diagram. (5)
- 6) Consider the following 8086 code fragment. (6)
- A) MOV CX,N
NOP
L1:NOP
NOP
NOP
LOOP L1
What should be the value of N to generate a delay of 1000μs, assuming that the clock frequency of 8086 is 5MHZ.
- B) Answer the following: (6)
- (i) Describe the bus unit of 80286.
(ii) Define faults and traps with an example for each.
- C) Write an 8086 ALP for the following: Define a procedure called FACT which computes the factorial of a given number including '0' and '1'. The parameters are passed to and from FACT using memory. (8)
- 7) Write short notes on 80386 virtual 8086 mode. (5)
- A)
- B) How can the parameters be passed to and from the procedures using pointers in 8086? Explain with an example program. (5)
- C) Answer the following: (7)

- i Discuss how 80386 computes physical address in paging mode with a neat sketch.
 - ii Answer the following: (3)
Write short notes on APIC feature of Pentium.
- 8) Discuss all the operational modes of 8255A. (8)
 - A)
 - B) Answer the following: (6)
 - i With a neat diagram, discuss the two integer pipelines of Pentium.
 - ii Answer the following: (2)
Write short notes on system management mode of Pentium.
 - C) Explain the concept of passing parameters to a macro with an example program. (4)

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