

BACHELOR OF INFORMATION TECHNOLOGY EXAMINATION, 2019**(2nd year, 2nd semester)****Microprocessors**

Time: 3 Hours

Full Marks: 100

CO1	[1] Answer any two from (A), (B) and (C) in this block	[20]
<p>A. (i) Explain the functions of the following in 8086: a) BIU, b) QUEUE, c) IP, d) CX, e) CS</p> <p>(ii) Explain the function of opcode prefetch queue in 8086. [6+4]</p> <p>B. (i) Explain the different addressing modes used in 8086.</p> <p>(ii) Identify memory addressing mode in the following instructions and calculate the effective offset address: a) MOV AX, 1000H b) MOV CX, [1000H] c) MOV AL, [SI+05] d) ADD AX, BX [6+4]</p> <p>C. (i) Illustrate the concept of segmented memory, with neat diagram and how it is implemented in 8086.</p> <p>(ii) Calculate physical address of memory to access Opcode and stack. IP = 8C46H, CS= 8420H, SS= 8C40H, SP= FFF0H. [6+4]</p>		
CO2	[2] Answer any two from (A), (B) and (C) in this block	[20]
<p>A. (i) Explain the following instruction with example. a) DAA b) CMP</p> <p>(ii) Write an 8086 assembly language programming to compute the value of function $f(X) = X^2 + 2x$ where X is an 8-bit number. [4+6]</p> <p>B. (i) Explain the following assembler directives with example of each. a) DW and DD b) MACRO and ENDM</p> <p>(ii) Explain with example conditional and unconditional jump instruction in 8086 with example of each. [4+6]</p> <p>C. (i) How will carry and zero Flags reflect the result of the instruction CMP BX, CX?</p> <p>(ii) Write a procedure to find factorial of a single digit number using recursive procedure. [4+6]</p>		
CO3	[3] Answer any two from (A), (B) and (C) in this block	[20]
<p>A. (i) Explain the function of the following signals: a) ALE b) $\overline{DT/R}$ c) \overline{BHE} d) NMI</p> <p>(ii) Draw and discuss the timing diagram of memory read cycle of 8086 in minimum mode. [4+6]</p>		

- B. (i) What is Interrupt Vector Table of 8086? Explain its structure.
- (ii) Write an ALP to create a file "RESULT" and store in it 20H bytes from the memory block starting at 0100:1200, if either an interrupt appears at INTR pin with Type 0AH or an instruction equivalent to the above interrupt is executed.

[3+7]

- C. (i) What is the difference between the software and hardware interrupt?
- (ii) Describe the response an 8086 will make, if it receives an NMI interrupt signal during a division operation which produces a divide by zero interrupt. Illustrate this concept.

[3+7]

CO4 [4] Answer any two from (A), (B) and (C) in this block [20]

- A. (i) What is the difference between static and dynamic RAM?
- (ii) Design and interface of an output port 74LS373 with 8086. Write an ALP to display 0 to 9 on a 7-segment display device. The output port address is 0010H.

[2+8]

- B. Design an interface between 8086 CPU and two chips of 8K EPROM and two chips of 16K RAM. Select the starting address of EPROM and the suitable address of the RAM, so that the address map of the system will continuous.

[10]

- C. (i) Draw the control word format of 8255. Explain it.
- (ii) Interface an IC 8255 PPI with 8086 in mode '0' with port A and B as output port and port C as input with address of port A is FF00H. Write a program to sense switch positions SW0 - SW7 connected at port C and store the value in CL register.

[4+6]

CO5 [5] Answer any two from (A), (B) and (C) in this block [20]

- A. (i) Generate 10ms delays in software?
- (ii) Design a programmable timer using 8253 and 8086. Interface 8253 at an address 0F20H for counter 0 and write an ALP to generate a square wave of 1 msec. The 8086 and 8253 run at 10MHz and 1.5 MHz respectively.

[4+6]

- B. Interface 8251 with 8086 at an address 0080H. initialize it in asynchronous transmit mode, with even parity enable, 7-bits character length, one start bit and one stop bit, frequency 160 kHz.

[10]

- C. (i) Explain physical address formation in protected virtual mode of 80286.
- (ii) What is the difference of it with real address mode?
- (iii) Explain the different addressing mode supported by 80386 over 80286.

[4+2+4]