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| **Course Name:** | **Microprocessors and Peripherals (2UXC404)** | **Semester:** | **IV** |
| **Date of Performance:** | 17-02-2021 | **Batch No:** | B2 |
| **Faculty Name:** | KCS | **Roll No:** | 1912052 |
| **Faculty Sign & Date:** |  | **Grade/Marks:** | \_\_\_/25 |

**Experiment No: 3**

**Title:** Multiplication of 32 bit numbers

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| **Aim and Objective of the Experiment:** |
| **Aim:** Write an 8086 based ALP to   1. Multiply two 32 bit numbers stored in the data segment and store the result back in the data segment.   **Objectives:**  To study basic instructions and addressing modes of 8086. Understand assembler directives and concept of data and code segment  This experiment covers following instructions groups.   1. Data transfer 2. Arithmetic ( Multiply instructions) |

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| **COs to be achieved:** |
| **CO 2.** Develop 8086 based assembly language programs for various applications. |

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| **Useful links** |
| NASM Assembler  <https://www.tutorialspoint.com/compile_assembly_online.php>  MASM/TASM Assembler |

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| **Work to be done** |
| 1. Upload image of handwritten algorithm/flowchart and lst file of the program and output screenshots . Also upload results for post lab questions.   data segment  n1h dw 1234h  n1l dw 5678h  n2h dw 1234h  n2l dw 5678h  prod dw 4 dup(0)  data ends  code segment  assume cs: code,ds:data  start: mov ax,data  mov ds,ax    mov cx,0  mov ax,n1l  mul n2l  mov prod,ax  mov prod+2,dx  mov ax,n1h  mul n2l  add prod+2,ax  adc prod+4,dx    mov ax,n2h  mul n1l  add prod+2,ax  adc prod+4,dx    jnc it4  inc cx  it4: mov ax,n1h  mul n2h  add prod+4,ax  adc dx,cx  add prod+6,dx    mov ah,4ch  int 21h  code ends  end start    HW    data segment  n1h dw 1234h  n1l dw 1234h  n2h dw 5678h  n2l dw 5678h  prod dw 4 dup(0)  data ends  code segment  assume cs: code,ds:data  start: mov ax,data  mov ds,ax    mov cx,0  mov ax,n1l  mul n2l  mov prod,ax  mov prod+2,dx  mov ax,n1h  mul n2l  add prod+2,ax  adc prod+4,dx    mov ax,n2h  mul n1l  add prod+2,ax  adc prod+4,dx    jnc it4  inc cx  it4: mov ax,n1h  mul n2h  add prod+4,ax  adc dx,cx  add prod+6,dx    mov ah,4ch  int 21h  code ends  end start |

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| **Post Lab Subjective/Objective type Questions:** |
| Q.1 Write an 8086 based ALP to find the factorial of a number in data segment and store the result back in data segment  data segment  A db 05h  fact dw 4 dup(0)  data ends  code segment  assume cs: code,ds:data  start: mov ax,data  mov ds,ax  mov ah,00  mov al,A  X:dec A  mov cl,A  cmp cl,01  jz stop  mul A  jmp X  stop: mov fact,ax  mov ah,4ch  int 21h  code ends  end start    Q.2. What is the output of the following instruction?  AX = 37D7H, BH = 151 decimal  DIV BH  Remainder will be stored in AH  Quotient in AL  AH=65H=10 decimal  AL=5EH=94 decimal  Q.3 What is the difference between MUL and IMUL? Explain with example  MUL Multipl byte or word (unsigned)  MUL,Integer multiply byte or word (signed) |

**Conclusion:**

Wrote 8086 program to multiply two 32 bit numbers stored in the data segment and store the result back in the data segment.

**Signature of faculty in-charge with Date:**