**Sir Syed University of Engineering & Technology**

ANSWER SCRIPT

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| --- | --- |
| Date: | June 12,2021 |
| Roll Number: | CS19-037 |
| Section: | A |
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| Course Name: | CS-330: Microprocessor & Assembly Language |
| Degree Program: | BSCS |
| Total number of pages being submitted: | 8 |

My Birth Year is 2000

**D1 = 2000**

My Date of Birth is 02-10-2000

**D2 = 0 + 2 + 1 + 0 + 2 + 0 + 0 + 0 = 5**

My Month of birth is 10

**D3 = 10**

My Roll no is 37

**D4 = 37**

My Date of Birth is 02-10-2000

**D5 = 2**

**ANSWER 01:**

1. D1 = 200016

D1 into decimal

= 2 \* 163 + 0 \* 162 + 0 \* 161 + 0 \* 160

= 2 \* 4096 + 0 + 0 + 0

= 8192 + 0 + 0 + 0

**D1 = 819210**

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D2 = 510

D2 into Hexadecimal

It is same as in decimal

**D2 = 516**

1. Find the 2’s compliment of D3 and D5 (Hexaecimal)

|  |  |
| --- | --- |
| D3 = 1010  For convert into 2’s compliment   1. Substract from FFFFFFFF 2. Add 1   FFFFFFFF  -0000000A  FFFFFFF5  + 1  FFFFFFF6  2’s Compliment of D3 is FFFFFFF616 | D5 = 216  For convert into 2’s compliment   1. Substract from FFFFFFFF 2. Add 1   FFFFFFFF  -00000002  FFFFFFFD  + 1  FFFFFFFE  2’s Compliment of D5 is FFFFFFFE16 |

1. Peform the following operaions on the given Data:
2. D4 / D2  ii. D3 – D4

|  |  |
| --- | --- |
| D4 / D2  = 7.4 | D3 – D4 = 10 – 37 = -27  **D3 – D4  = -27** |



|  |  |
| --- | --- |
| To Represent -D4  To get the two's complement negative notation of an integer, you write out the number in binary. You then invert the digits, and add one to the result.  D4  = 3710  = 001001012  Invert the digits  = 110110102  Add 1  110110102  + 1  110110112  **D4  = 110110102**  **-D4  = 110110112** | To Represent -D2 (Hex)  To get the two's complement negative notation of an integer, you write out the number in binary. You then invert the digits, and add one to the result, then convert this into hexadecimal.  D2 = 510  = 000001012  Invert the digits  = 111110102  Add 1  111110102  + 1  111110112  Convert this in to hexadecimal  1111 10112  FB16  **D2  = 516**  **-D2  = FB16** |

1. D1 = 2000

|  |  |
| --- | --- |
| In UnPacked BCD  = 00000010 00000000 00000000 00000000  Total no of bytes for Unpacked BCD: 4 bytes | In Packed BCD  = 0010 0000 0000 0000  Total no of bytes for Packed BCD:  2 bytes |

**ANSWER 02:**

1. Physical address = (D1 \* 10)h

As we know that

Physical address = Segment Address \* 10h + offset Address

By comparing we have:

Segment address : 2000

Offset Address: 0000

Logical address: segment address: offsetAddress

**Logical address = 2000 : 0000**

1. Physical memory location = D4 = 37h = 37 \* 1000= 37000h

DS = D1 = 2000

Lower range for DS = (2000\*10) + 0000 = 20000

Upper range for DS = (2000\*10) + FFFF= 2FFFF

37000 is greater than range.

The requires value for DS is:

Offset = D2 = 5

Physical address = Segment Address \* 10h + offset Address

37000 = (DS \* 10) + 5

37000 – 5 = DS \* 10

36995 = DS \* 10

**DS = 3699.5h**

**ANSWER 03:**

1. D1 = 200010

Convert this into Hexadecimal

16 | 2000

16 | 125 🡪 0

| 7 🡪 D

D1 = 7D016

For no of count in D1 we mst convert it into Binary

D1 = 200010 = 111110100002

No of ones in D1 = is 6

6 in BCD = 000001102

CODE:

.Model Small

.Stack 100h

.Data

DATA1 DW 7D0h

COUNT DB ?

.Code

MAIN PROC

MOV AX,@DATA ;to initialize DS

MOV DS,AX

SUB AL, AL

MOV DL, 16

MOV BX, DATA1

AGAIN:

ROL BX, 1

JNC NEXT

ADD AL, 1

DAA

NEXT:

DEC DL

JNZ AGAIN

MOV COUNT, AL

Mov AH, 4CH

Int 21h

MAIN ENDP

END MAIN

1. **CODE**

.Title Q3b

.Model Small

.Stack 100h

.Data

value DW 2000h,5h,10h,37h,2h

Result DB ?

.Code

MAIN PROC

MOV AX,@DATA ;to initialize DS

MOV DS,AX

MOV CX,4

MOV BX, OFFSET value

MOV AL, [BX]

LBACK:

CMP AL, [BX+1]

JC SW=AP

SBACK:

INC BX

LOOP LBACK

JMP TER

SWAP:

MOV AL, [BX+1]

JMP SBACK

TER:

MOV Result, AL

MOV AH,4CH

INT 21H

MAIN ENDP

END MAIN

**ANSWER 04:**

1. **CODE:**

.Title Q5a

.Model Small

.Stack 100h

.Data

D2 DB 5

D4 DB 37

.Code

MAIN PROC

MOV AX,@DATA ;to initialize DS

MOV DS,AX

MOV AL,D2

MOV BL,D4

ADD AL,BL

MOV AH,4CH

INT 21H

MAIN ENDP

END MAIN

37 00100101

+5 +101

42 00101010

OF = 0 CF = 0 PF = 0 AF = 0 SF = 0 ZF = 0

1. **CODE:**

.Title Q4B

.Model Small

.Stack 100h

.Data

ASCII DB ‘2000,5,10,37,2’

BCD DB 5 DUP(?)

STRING DW ‘INCOREECT DATA’

.Code

MAIN PROC

MOV AX,@DATA ;to initialize DS

MOV DS,AX

LEA SI, ASCII

LEA DI, BCD

MOV CX,5

LOOP:

MOV AX,[SI]+CX

SUB AX, 3030H

ROL AH , CX

ADD  AH ,AL

MOV [DI]+CX, AH

DEC CX

JN ALERT

JNZ LOOP

ALERT:

LEA DX,STRING

MOV AH,09H

INT 21H

MOV AH,4CH

INT 21H

MAIN ENDP

END MAIN

**ANSWER 05:**

1. Name : “Munib”

**CODE:**

.Title Q5a

.Model Small

.Stack 100h

.Data

HEX DB ‘6d, 75, 6e, 69, 62’

ASCII DB ?

.Code

MAIN PROC

MOV AX,@DATA ;to initialize DS

MOV DS,AX

MOV AL,OFFSET HEX

AND AL,0FH

CMP AL,09H

JBE DOWN

ADD AL,07H

DOWN:

ADD AL,30H

MOV CL,05H

ADD AH,0F0H

ROL AH,CL

JBE UP

ADD AH,07H

UP:

ADD AH,30H

MOV ASCII,AX

MOV AH,4CH

INT 21H

MAIN ENDP

END MAIN

1. **CODE:**

.Title Q5b

.Model Small

.Stack 100h

.Data

String DB ‘ANdul Ghani’

.Code

MAIN PROC

MOV AX,@DATA ;to initialize DS

MOV DS,AX

MOV ES, AX

LEA DI, Sting

MOV CX, 11

MOV AL,’b’

REPNE SCASB

JNE OVER

DEC DI

MOV BYTE PTR [DI],’B’

OVER:

MOVAH,09

MOV DX, OFFSET String

Int 21h

MOV AH,4CH

INT 21H

MAIN ENDP

END MAIN

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