Lab 6

**Part A:** Add these **unsigned** binary numbers.

1) 1110 + 1111=

1110

+ 1111

111012

**Part B:** Subtract these **unsigned** binary numbers

2) 100111- 1111=

100111

- 1111

110002

**Part C:** Convert -1210 to an 8-bit **one’s** complement number (show your work)

3)Convert +123 to an 8-bit **one’s** complement number

+123 = 011110112

1. Convert -123to an 8-bit **one’s** complement number

123 = 01111011

-123 = 100001002

**Part D:** Convert -910 to an 8-bit, **two’s** complement binary number (show your work)

1. Convert 45(decimal) to an 8-bit, **two’s** complement binary number

45 = 001011012 positive number, one’s complement = two’s complement = binary

1. Convert –72(decimal) to an 8-bit, **two’s** complement binary number

72 = 01001000

72 = 10110111 one’s complement

+ 1

101110002 two’s complement

**Part E:** Using the **two’s complement** method **subtrac**t these binary numbers. (Show your work)

1. 0001 0010 - 0000 0111 =

1111 1000 one’s complement (minus number)

+ 1

1111 1001 two’s complement (minus number)

0001 0010

~~1~~ 0000 10112 (1 discarded) Answer

1. 0001 0101- 0000 1101 =

1111 0010 one’s complement (minus number)

+ 1

1111 0011 two’s complement (minus number)

0001 0101

~~1~~ 0000 10002 (1 discarded) Answer

**Part F:** Using the **Two’s complement** method **add** these **decimals** numbers

Note: you should convert these numbers to binary. (**overflow problem**) Show your work

1. 44+45= 89

44 = 0010 1100 two’s complement

45 = 0010 1101 two’s complement

0010 1100

+ 0010 1101

0101 10012 Answer

Carryout: No

Overflow: No

Sum is: correct

1. (-103)+ (-69)= -172

103 = 0110 0111

1001 1000 one’s complement

+ 1

1001 1001 two’s complement (-103)

69 = 0100 0101

1011 1010 one’s complement

+ 1

1011 1011 two’s complement (-69)

1001 1001

+ 1011 1011

~~1~~ 0101 01002 (1 discarded) Answer

Carryout: yes

Overflow: yes

Sum is: not correct

1. -39+92=53

39 = 0010 0111

1101 1000 one’s complement

+ 1

1101 1001 two’s complement (-39)

92 = 0101 1100 two’s complement

1101 1001

+ 0101 1100

~~1~~ 0011 01012 (1 discarded) Answer

Carryout: yes

Overflow: no

Sum is: correct

1. 127+1= 128

127 = 0111 1111 two’s complement

1 = 0000 0001 two’s complement

0111 1111

+ 0000 0001

1000 00002 Answer

Carryout: No

Overflow: Yes

Sum is: not correct