

EE 2905

Dr. Johnson

Homework 2

1 – Write each of the following numbers using the designated representation you must show your work . 15pts

Decimal Value (convert to 8 bit unsigned binary)

202

202

128s	64s	32s	16s	8s	4s	2s	1s
1	1	0	0	1	0	1	0
74	10	10	10	2	2	0	

1100 1010

Decimal Value (convert to 8 bit two's-complement)

-86

-86

0	64s	32s	16s	8s	4s	2s	1s
0	1	0	1	0	1	1	0
86	22	22	6	6	2	0	

0101 0110

negative - convert

convert

1010 1010

Decimal Value (convert to 8 bit two's-complement)

95

95

0	64s	32s	16s	8s	4s	2s	1s
0	1	0	1	1	1	1	1
95	31	31	15	7	3	1	

0101 1111

no convert

0101 1111

2 – Write each of the numbers in the designated representation in base 10 you must show your work . 15pts

Binary Value (8 bit unsigned binary) --> Decimal

1000 1101

	128s	64s	32s	16s	8s	4s	2s	1s	
1000 1101	1	0	0	0	1	1	0	1	<input type="text" value="141"/>
	128	128	128	128	136	140	140	141	

Binary Value (8 bit two's-complement)--> Decimal

1100 0001

		64s	32s	16s	8s	4s	2s	1s	
1100 0001	Convert	0	0	1	1	1	1	1	<input type="text" value="-63"/>
		0	0	32	48	56	60	62	63

neg

Binary Value (8 bit two's-complement)--> Decimal

0100 0001

		64s	32s	16s	8s	4s	2s	1s	
0100 0001		0	1	0	0	0	0	0	1
		0	64	64	64	64	64	64	65

3 – Convert the following numbers - you must show your work.

20pts

Decimal Value --> Hex (assume 2's complement)

-88

-88

	64s	32s	16s	8s	4s	2s	1s
	0	1	0	1	1	0	0

0101 1000

negative - convert

88	24	24	8	0	0	0
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convert 1010 1000

Binary Value (8 bit two's-complement)--> Hex

1100 0001

1100 0001

Binary Value (8 bit unsigned binary) --> Hex

1100 0001

1100 0001

Hex Value (8 bit unsigned binary) --> Decimal

0xCC

0xCC

128s	64s	32s	16s	8s	4s	2s	1s
1	1	0	0	1	1	0	0
128	192	192	192	200	204	204	204

11001100

4 – Choose the best type of variable for each of the following and select a meaningful name and write a declaration for each.

(bool, char, int, float, float complex)

25pts

	type	name
# of cars in MSOE garage no partial cars	int	num_cars;
average temperature in March 32.5	float	temp_ave;
indicates the garage is full or not T or F	bool	garage_full;
rectangular coordinates on the complex unit circle 1.414 + j1.414	float complex	coord;
middle initial	char	middle_initial;

5 – Choose the best type of variable for each of the following, select a meaningful name and write a declaration for each.

(int8_t, uint8_t, int16_t, uint16_t, int32_t, uint32_t)

25 pts

	type	name
number of students at MSOE $256 < \# < 16535$	uint16_t	stud_cnt;
distance from earth to moon $238,900 \text{ Mi} > 16535$	uint32_t	earth_moon;
# of skittles in a small bag $0 < \# < 255$	uint8_t	num_skittles;
net number of students leaving the CC building in a 10 minute time period + or -, < 65535	int16_t	students_out;
age difference between two siblings + or -, < 255	int8_t	age_diff_sib;