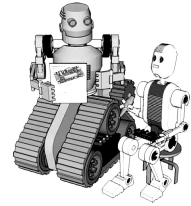


NAME _____

1st Semester Midterm
10/09/08
BCHS Advanced Computer Programming
Introduction to Robotics
4th Period 2008-2009



In Class Re-Test: Answer questions in a way that shows you understand why rather than give an example to show how. Convince me you that you understand the material.

Data Representation

1. Why do computers use binary numbers ?

2. Why do we use the hexadecimal number system when working with computers ?

3. Count from 0_{10} to 10_{10} in base 5.

4. Is it possible to tell exactly what numbers from computer memory mean without additional information? YES NO

If no, what information is needed and where does it come from?

5. A) How do you find the 1's compliment of a binary number.

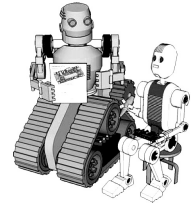
Two time we need to use 1's comp numbers.

C) _____

D) _____

NAME _____

1st Semester Midterm
10/09/08
BCHS Advanced Computer Programming
Introduction to Robotics
4th Period 2008-2009



6. True or False

- T F When you take the 2's comp of a positive number it remains unchanged.
- T F When you take the 2's comp of a negative number it remains unchanged.
- T F 2's comp is used to represent unsigned numbers.
- T F The 2's comp representation of 5 is -5.

7. Given two numbers A and B in 2's comp representation.

A) How do I add them?

B) How do I subtract them?

8. Work this problem and produce an 8 bit answer.. Subtract the two eight bit numbers 0x55 from 0x30 using 2's compliment and show your work **in great detail. Write clearly!**

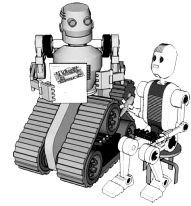
9. What does BCD stand for.

10. Count for 1_{10} to 15_{10} in BCD.

0000 0001, 0000 0010, _____, _____, _____,
_____, _____, _____, _____, _____,
_____, _____, _____, _____, _____,

NAME _____

1st Semester Midterm
10/09/08
BCHS Advanced Computer Programming
Introduction to Robotics
4th Period 2008-2009



11. Describe a method to convert hex numbers to decimal.

12. Convert 0xA5 to decimal using the method you described above.
Show work in detail, write clearly.

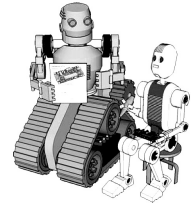
13. Matching

___	bit	a	1 bit
___	byte	b	2 bits
___	nibble	c	4 bits
___	char	d	5 bits
___	Int	e	8 bits
___	unsigned char	f	9 bits
___	unsigned int	g	10 bits

14. You found an old computer in your grandmothers attic. The computer starts and is prompting you for a password. The documentation you found with the computer says

NAME _____

1st Semester Midterm
10/09/08
BCHS Advanced Computer Programming
Introduction to Robotics
4th Period 2008-2009



the password is stored at memory location 0x100 and is always 5 characters long. Using a stand alone memory tool you were able to determine that memory starting at location 0x100 contained the following.

0x41 0x53 0x43 0x49 0x49

From this you determined that that password was ASCII. Why?

The C language

15. What is a variable ?

16. Given the following.

```
#pragma config LVP=OFF, ...  
#include <p18F1320.h>
```

What do #pragma's do in general ?

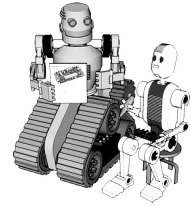
What does this #pragma do ?

Where can you find information on what parameters to add after the config keyword?

What do #include's do in general ?

NAME _____

1st Semester Midterm
10/09/08
BCHS Advanced Computer Programming
Introduction to Robotics
4th Period 2008-2009



Why do we need this #include ?

Bonus (2pts)

What is the difference between #include <filename> and #include "filename" ?

17. Matching, If a variable is declared correctly match it with the range of numbers it can represent. If it generates a compiler error use choice "i".

Answers may be used more than once.

___	char x;	a	0..255
___	unsigned int;	b	-32768..32767
___	int x;	c	-32768..32768
___	unsigned int x;	d	0..65536
___	unsigned char x;	e	0..65535
___	unsigned x;	f	-128..128
		g	-128..127
		h	None of the above
		i	ERROR: Invalid variable declaration

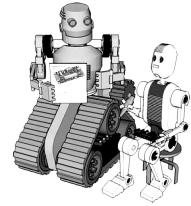
18. Write a for loop that ranges variable aa from:

-3..5	for(; ;)
5..-3	for(; ;)

19. Write a while loop that ranges variable aa from:

NAME _____

1st Semester Midterm
10/09/08
BCHS Advanced Computer Programming
Introduction to Robotics
4th Period 2008-2009



-3..5	while () { }
-------	------------------------------------

20. In the MPLAB you press control-M to find matching braces. How is this useful ?

21. If you do can not see the build icon in MPLAB it is because you opened a _____ instead of a _____.

22. Matching

	Arithmetic		Meaning
	++	a	Division
	--	b	Remainder or modulo
	/	c	Addition
	%	d	Decrement
	-	e	Subtraction
	+	f	Increment

23. Why do we use code blocks ? _____
