IB Computer Science
Unit 1

C Programming
Exam #1

Student_____

Date: _____

(10 pts) Questions 1 through 3 use the following program, complied with the command line
gcc testargs.c –o args

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>

void print_args(int argc, char *argv[]) {
     int i;
     printf("\t|");
     for (i = 0; i < argc; i++) {
         printf("%s\t|",argv[i]);
         }
     printf("\nArg#\t|");
     for (i = 0; i < argc; i++) {
         printf("%d\t|",i);
         }
     printf("\n");
     }
int main(int argc, char *argv[]) {
    print_args(argc, argv);
    return 0;
    }
```

1	What is the exact output when the program is executed from the command line using: `./args testing 1 2 3`
2	What is the exact output when the program is executed from the command line using: `./args testing one two three 1 2 3 eight`
3	What is the exact output when the program is executed from the command line using: `./args`

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Questions 4 – 10

Directions

Match the function description with the function name from the "Function Bank" . (6 pts)

Function Bank

atoi	scanf	pow
strlen	printf	Sizeof
strcpy	strcat	malloc

4)_____	Converts alphabetical string s to an integer.
5)_____	Appends the value of one string to the end of another string
6)_____	Reads the arguments from standard input.
7)_____	Sends data / output to standard output.
8)_____	used to find the value of a base number raised to a power.
9)_____	Allocate a memory block of size bytes; return the memory location of where it starts.
10)_____	Returns the size, in bytes, that the item takes up in memory. Though this looks like a function call it is actually an operator.

Question 11

Directions

Mark each variable declaration as valid or invalid (4 pts)

Declaration	Valid/Invalid	Declaration	Valid/Invalid
`int _30days;`		`double monny;`	
`int 12months;`		`int qa99;`	
`real C3P0;`		`char _my_string;`	
`char @tweet[140];`		`char sting[10];`	

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Q #	Question	Your Answer

12
(3 pts)
	What is the output of the program below?
	`#include <stdio.h>`
	
	`int main() {`
	
	`int j = 2049;`
	`int i;`
	`for (i = 1; i<= 10; i++) {`
	`j = j / 2;`
	`}`
	`printf("i = %d and j = %d\n",i,j);`
	`}`	

13 (3 pts)	If the initial value of j is changed above to 49,100,011 what would the output of the program be? Right, it would not compile, what if the value of j were changed to 49100011?	
14 (3 pts)	What does this program do? If you were to prompt the user for a value, what would the prompt be and how can you improve the message about the value of j?	

15
(1 pt)
	Given the following declaration:
	`char prompt[20]="Enter n: ";`
	
	What is the output of the following C statement?
	`printf("prompt[4] = %c\n",prompt[4]);`	

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Direction

For each Question in Column A, select the best match from Column B. Write the letter corresponding to the best match next to the Q#.

Note: This is from one of the quizzes – I may include something similar

Q#	Column A Question	Column B Match	
Example 0 __M_	a = 3;	**A**	A prototype for a function that accepts a string parameter and does not return a value.
1 _____	`i++;`	**B**	A prototype for a function that accepts an integer parameter and does not return a value.

2 _____	`for (i=1; i<10; i++) {`
	`  // statement group`
	`}`
		C	Assigns the difference of j and j to c, which is another way to set the variable c to zero.

3_____	`i=0;`
	`while (i <= 10) {`
	`  // statement group`
	`  i++;`
	`}`
		D	Assigns the value of j squared to varable c.

4_____	`c = j * j;`	**E**	Assigns the value of two times j to variable c.
5_____	`c = j + j;`	**F**	Declares three variables as integers and initializes all of them to zero.
6_____	`int x,y,z = 0;`	**G**	Declares three variables as integers. Initializes the third variable to zero.
7_____	`void peace(int j);`	**H**	Executes a group of statements exactly 10 times.
8_____	`a = 25.0 * 3.0 / 2.5;`	**I**	Executes a group of statements less than 10 times.
		J	Executes a group of statements more than 10 times.
		K	i=i+1;
		L	Assigns the value 30 to a variable named **a**.
		M	Assigns the value 3 to a variable named **a**.

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Part 3: Multiple Choice:

Directions: Circle the letter that is next to the **best** choice.

Each question is worth 1 point, unless otherwise noted.

1. The command gcc –o my_program my_program.c compiles my_program.c into my_program.
   a. True
   b. False
2. Compile time is:
   a. What is happening when a program runs
   b. What is happening when you are writing source code
   c. What is happening when you run gcc
   d. What is happening as your program is being used by a user
3. Lines that begin with # are:
   a. Comments
   b. Constants
   c. Preprocessor directives
   d. Conditional compilation directives
4. Execution of a C program begins with
   a. The first module compiled
   b. A function designated on the command line
   c. The begin() function
   d. The main() function
5. A switch statement:
   a. Can have more than one default label
   b. Does not need to have the keyword case used
   c. Might fall through if a break isn't used
   d. Will execute all the cases one after the other automatically
6. To print the number 3.1415926, printf() uses the following control string:
   a. %12.7d
   b. 12.7%e
   c. %s
   d. %13.8f

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7. What part of this code refers to the preprocessor?

```
/* Read in two integers and print their sum.*/

#include <stdio.h>

int main(void)  {
     int a, b, sum;

     printf("Input two integers: ");
     scanf("%d%d", &a, &b);
     sum = a + b;
     printf("%d + %d = %d\n", a, b, sum);
     return 0;
}
```

a. The variable declaration

b. printf() and scanf()

c. return

d. #include <stdio.h>

8. In C, a character such as 'A' is of data type int.

a. True

b. False

9. The sizeof operator returns:

a. The number of blocks in an expression

b. The number of bits in an expression

c. The number of bytes in an expression

d. The number of elements in an expression

10. To increment a number, I can do either of the following:

a. x++ or x = x + x

b. x+ or x = x + 1

c. x++ or x + 1 = x + 1

d. x++ or x = x + 1

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11. (5 pts) What is the output of the following program?

```
#include <stdio.h>

int funct(int n){
    int ret;
    if (n < 1)
       ret = 1;
    else
        ret = n * funct(n-1);
    return ret;
}
int main(void) {
     int sum = 0, i;
     for (i = 0; i<4; ++i)
          sum += funct(i);
     printf("%d\n", sum);
     return 0;
}
```

a. 100
b. 1

c. 7

d. 10

12. Convert this while statement into a for statement:

```
include #<stdio.h>

int main() {
     int x;
     int output;
     output = 0;
     x = 50;
     while (x >= 0) {
          output = x + 1;
          printf(x is %d\t", x)
          printf(output is %d\n", output)
          x --;
          }
} // end main
```

a. for (x ++, x = 50, x > 0)

b. for (x = 50, x--, x >= 0)

c. for (x = 50, x >= 0, x--)

d. for (x >= 0, x = 50, x --)