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All statements should be written in C++.

You may find a partial ASCII table at the end of this document.

1. [4 pts] Write the preprocessor directive that you would need to use for the followings.

I. `cout << "What is your initials?"; #include < ...iostream ...>`

II. string name `#include < ...string ...>` "Headers"

III. `abs(x)` `#include < ...cmath ...>`

IV. `setprecision(2)` `#include < ...iomanip ...>`

2. [4 pts] Distinguish each of the variable name if it is legal or illegal. If illegal, explain why.

Variable name		
	Legal?(Y/N)	If illegal, why?
<u>tax amount</u>	N	whitespace
<u>taxAmount</u>	Y	
<u>2018tax</u>	N	begin with numbers
<u>tax2018</u>	Y	
<u>tax\$</u>	N	special characters

3. [2.5 pts] Identify the validity of the following statement(s). If a statement is invalid, explain why not.

Statement(s)	Validity	
	Valid/ invalid	If invalid, why?
<code>const double MOR_RATE = 4.27;</code>	Valid	
<code>const double MOR_RATE = 4.27; MOR_RATE = 3.75;</code>	invalid	two statements 1st is valid & 2nd is NOT
<code>const double MOR_RATE;</code>	invalid	No constant value

4. [4 pts] Which of the following are valid character literals?

* Literals are the constant values of variables.

literal	Character Literal (Y/N)	if not a character literal, why?
I. 68	N	No Quotes / int literal
II. "C"	N	double Quotes
III. 'c'	Y	-
IV. "\0"	N	double Quotes / reserved char
V. 'B+'	N	Special character

5. [2 pts] You are to write a program to maintain the student scores of a class.

Write statements to do each of the followings:

- Define a variable with a proper type and a proper name for the number of students in this class. variable = 30
- Assign 30 to the variable.

..... const int STUDENT_NUM = 30;

cout << "The number of students in the class: " << STUDENT_NUM << endl;

- [4 pts] If income and expenditure are numeric variables, and companyName is a string variable, which of the following statements are valid assignments? If a statement is not valid, explain why not.

	Statement	Validity (Y/N)	If invalid, why?
I.	income = 100;	Y	-
II.	expenditure = "2400.99";	N	numeric variable Quoted
III.	income = 31,305.52;	Y	-
IV.	companyName = "ABC company";	Y	-
V.	income * 2.1 = expenditure;	N	2.1 is not defined

Technically this works, I think....

If z.1 was a constant float variable?

* I think I made this mistake on my grade calc.

7. [3 pts] Write ONE statement that consolidate the following statements.

```
int flightNum = 89;
int travelTime;
int departure = 10;
int distance;
```

are these const int??

** Two statements*

```
int travelTime; } int flightNum = 89;
int distance; } travelTime, departure = 10,
const int FLIGHT_NUM = 89; } distance;
DEPARTURE = 10; }
```

* or does this work?

8. [2 pts] Write down a complete C++ initialization statement to store a letter grade. Name the variable grade and set the value to be A.

```
char grade = 'A';
```

9. [3 pts] Complete the following table by calculating and writing the value of each C++ expression

PEMDAS

Expression	Value
$x = 5 + \frac{2}{7} * 8 - 3$	X = 12
$x = (5 + 2) * 4 + 10 / (5 - 3)$	X = 33
$x = 4 + 2 * (6 - 2) + (4 + 17) \% 2 - 1$	X = Need help with modulo % = modulo

?
* mod x
X mod y = A
X/y = B
B.y = C
C-B = A

10. [2 pts] Convert the following Algebraic expressions to programming statement (you may assume the variable definition has been done priori):

$$\text{distance} = p(5rs + \frac{4}{3}r^{30})$$

* Need help

11. [2.5 pts] Assume the following variable definitions and predict the output.

`short LuckyNum = 2;` * Does the value matter when finding `sizeof()`?
`char initials = 'R';`

* What kind of problems would we use `sizeof()`?

Statement	Output
<code>cout << sizeof(initials) << endl;</code>	1
<code>cout << sizeof(LuckyNum) << endl;</code>	2
<code>cout << sizeof(2 * LuckyNum) << endl;</code>	4
<code>cout << sizeof(2 * 1.0) << endl;</code> * Is 1.0 calculated as float? 8	8
<code>cout << sizeof(2 * initials) << endl;</code>	4

→ Size of data type or size of operand

* What is the size it's finding?
→ bytes?

12. [5 pts] Assume `int x = 6, a = 2, b = 3, c = 1, d = 2`. Find the value of x after the statement.

Will we need to memorize the byte sizes of all data types?

Are these consts?

Statement	Value of x
<code>x += 4 + b;</code> 6 + 2 = 8	13
<code>x -= 3 * d;</code> 8 - 6 = 2	0
<code>x *= 11 - c;</code> 0 * 10 = 0	60
<code>x /= b;</code> 60 / 3 = 20	2
<code>x %= d;</code>	0 * Need help/modulo

What would be the output of the each of the following sample codes; Assume individual codes were embedded in an error free program (#13 - #22 - 2 pts each).

13.

```
cout << "Blue " << endl << "Green" << endl << "Red";
```

output:

Blue.....

Green.....

Red.....

14.

```
cout << "one " << "two " << "Three";
```

Output:

.....onetwoThree.....
.....
.....
.....

15.

*Is this how we use multiple
inputs?

```
cout << "Enter the last three temperature readings." << endl;  
cin >> temp3 >> temp2 >> temp1;  
cout << temp1 << endl << temp2 << endl << temp3 << endl;
```

Output:

```
Enter the last three temperature readings.  
101 100 98 [Enter]
```

.....
101
.....

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100
.....

.....
98
.....

16.

```
string school = "Webster";  
cout << "My School is " << school;
```

Output:

.....
My School is Webster.....

17.

* Const?

```
double number = 7.5;  
cout << number << endl;
```

output:

7.5

18.

* would this be const?

```
double tmpNumber = 7.5;  
int number = tmpNumber;  
cout << number << endl;
```

output:

7

19.

```
double ratio;  
ratio = 5 / 2;      * even if it's double(data type) if there are no  
                      decimals then the output has none?  
cout << ratio << endl; * I thought it would be 2.5 but it was 2 *
```

output:

2

20.

```
double ratio;  
ratio = 5.0 / 2.0;  
  
cout << ratio << endl;
```

output:

2.5

21.

```
int ratio;
ratio = 5 % 2;

cout << ratio << endl;
```

output:

.....
.....

22. [3 pts] Write the output. * I was confused by,
, this format.

Statement	Output
cout << 11 / static_cast <float> (2);	5.5
cout << static_cast <char> (66);	B
cout << static_cast <float> (11/2);	5

* is that
because
there's
two
characters?
1=A
2=B
3=C ?

23. [2 pts] Write the output of the following statement in the given space.

double distance = 62.3472;

Is this
const?

```
cout << fixed << setprecision(2) << distance << endl
      << scientific << setprecision(3) << distance << endl;
```

output:

62.35
6.235e+01

24. [3 pts] Write the output of each statement.

Statement	Output
cout << pow(2.0, 3.0);	8
cout << abs(-6);	6
cout << sqrt(4.0);	-2

* Need help

- I missed p1-13 chapter 3 because
Dentist appt.

*page 2
chapter 3

25. [2 pts] Fill in the blank with a single statement that reads the user input given in one-line (as in the output: 470 Lockwood Ave) and store it in the variable `address`.

```
string address;  
cout << "Enter the address";  
.....  
getline(cin, address); * Can we go over.....  
cout << endl << address;
```

Output:
Enter the address
470 Lockwood Ave[Enter]

L is that just for newline?

26. [2 pts] Write a statement to read a character, including white characters, from the keyboard and store it in the variable `continue`.

```
char continue;  
cout << "Press any key to continue....";  
.....  
*need Help
```

27. [4 pts] Write a C++ statement to get the following output.

You may NOT use any spaces or tabs to align the output. Use only stream manipulators: `setw()`, `fixed`, `setprecision()`, `left`, and `right`. Note: The borders and the serial numbers are just to make it easier to read; they would not be displayed in the output. Also assume the following statements already have been made.

```
double price = 2.75  
count = 13,  
total;
```

**need help*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
G	a	l	l	o	n	P	r	i	c	e			2	.	7	5	
G	a	l	l	o	n	C	o	u	n	t					1	3	
T	o	t	a	l							3	5	.	7	5		

*will this be the exact problem?

28. [8 pts] Write a *main()* function of a program that reads the width and the length of a rectangle from the key board and calculate the area. Then your program should output the result on the screen; You may assume both the width and length hold only whole numbers.

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*Some prob?

29. [8 pts] Write a `main()` function of a program that calculates the fuel price for customer's gasoline purchase. The program should have the price of a gallon initialized to 2.95 and it should ask the number of gallons pumped from the user and take as a keyboard input, and display the price on the screen.

Same?

30. [12 pts] Write a complete program that reads a full name as a three-word user input (i.e., first name, middle name, and last name) and store them in THREE different variables. Then display the first name and the last name on the screen.