

Final Exam Exercises

CS 1428
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MC: Expressions

What is the value of the variable x after executing the following statement?

```
float x = 13/4;
```

- (a) 3.25
- (b) 3.3
- (c) 3.0
- (d) 1.75

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MC: Function Calls

You have the following function prototype in your program:

```
void factorial(int);
```

given: `int x; int factor;` in main, indicate if the following function calls in main are valid or not.

- 1. `factorial(17);` (a) valid (b) not valid
- 2. `factorial(x);` (a) valid (b) not valid
- 3. `factorial(factor-17);` (a) valid (b) not valid
- 4. `x = factorial(100);` (a) valid (b) not valid

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T/F: Scope

If a variable named x is defined in function main:

- 1. You cannot have a variable named x in another function. (a) true (b) false
- 2. You cannot declare another variable named x inside main (unless it is inside a nested block). (a) true (b) false
- 3. You cannot declare a parameter named x in another function. (a) true (b) false
- 4. You cannot declare a variable named x that is global to all functions. (a) true (b) false

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Values of Expressions

What is the value of the following expressions?

```
int i, j = 6, k = 2; //given this
```

1. $28 / 4 - k$
2. $j + 12 * k - 8$
3. $j + 17 \% 3 - k$
4. $k + 22 * (9 - 7)$
5. $12 / (10 - j)$
6. $(19 - 3) * (k + k) / 4$
7. $i = 38.9;$ //what is stored in i?
8. $k > 0 \ \&\& \ \text{false}$ (a) true (b) false (c) unknown (d) error
9. $k > 0 \ || \ k < 10$ (a) true (b) false (c) unknown (d) error
10. $k < 0 \ || \ k > 10$ (a) true (b) false (c) unknown (d) error

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Tracing #1

What is output by the following program?

```
int fun(int &x, int y) {  
    x = 3;  
    y = 4;  
    return 5;  
    x++;  
}  
int main() {  
    int a = 1, b = 2, c = 3;  
    c = fun(a, b);  
    cout << a << " " << b << " " << c;  
}
```

- (a) 1 2 3 (b) 3 4 3 (c) 3 4 5 (d) 3 4 6 (e) 3 2 5

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Tracing #2

What is output by the following program?

```
const int SIZE = 5;  
void sky(int a[ ]) {  
    a[1] = 25;  
    a[SIZE-1] = 66;  
}  
int main() {  
    int nums[SIZE] = {1,2,3,4,5};  
    sky(nums);  
    for (int i=0; i<SIZE; i++)  
        cout << nums[i] << " ";  
    cout << endl;  
}
```

- (a) 1 2 3 4 5
(b) 25 2 3 66 5
(c) 1 25 3 66 5
(d) 1 25 3 4 66
(e) 25 2 3 4 66

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Find the errors

This function that should calculate and return the average of three integers. Rewrite the function to fix the errors in the function definition.

```
double average(int value1, int value2)  
{  
    average = value1 + value2 + value3 / 3;  
}
```

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Programming: Chapter 2

Convert the following pseudocode to C++ code. Be sure to declare the appropriate variables:

Store 172.5 in the *force* variable.

Store 27.5 in the *area* variable.

Divide *area* by *force* and store the result in the *pressure* variable.

Display the contents of the *pressure* variable.

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Programming: Chapter 3

Write a program that asks the user to enter a golfer's score for three games of golf, and then displays the average of the three scores.

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Programming: Chapter 4

Using the following chart, write a nested `if/else` statement that assigns .10, .15, or .20 to `commission`, depending on the value in `sales`. Try not to use any redundant boolean expressions in your `if/else` statement.

Sales	Commission Rate
Under \$10,000	10%
\$10,000 to \$15,000	15%
Over \$15,000	20%

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Programming: Chapter 5

A. Write a `for` loop that displays the following set of numbers:
0, 10, 20, 30, 40, 50 . . . 1000

B. Write a code segment that asks the user to "enter a series of positive numbers, then enter a -1 when finished." Your code should compute and output the sum of the numbers (do not include -1 in the sum).

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Programming: Chapter 6

A. The following statement calls a function named `half`. The `half` function returns a value that is half that of the argument. Write the function.

```
result = half(number);
```

B. Write a function named `getNumber` that uses a reference parameter variable to accept an integer argument. The function should prompt the user to enter a number in the range of 1 through 100. The input should be validated and stored in the parameter variable.

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Programming: Chapter 7

- A. The arrays `numberArray1` and `numberArray2` have 100 elements. Write code that copies the values in `numberArray1` to `numberArray2`.
- B. Write a program that lets the user enter ten values into an array. The program should then display the largest and smallest values stored in the array.
- C. In a program, write a function that accepts three arguments: an array, the size of the array, and a number `n`. Assume the array contains integers. The function should display all of the numbers in the array that are greater than the number `n`.

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Programming: Chapter 11

The structure `Car` is declared as follows:

```
struct Car {  
    string carMake;  
    string carModel;  
    int yearModel;  
    double cost;  
};
```

A. Define an array of 35 of the `Car` structure variables. Initialize the first three elements with the following data:

Make	Model	Year	Cost
Ford	Taurus	1997	\$21,000
Honda	Accord	1992	\$11,000
Lamborghini	Countach	1997	\$200,000

B. Write a loop that will step through the array you defined in Question A, displaying the contents of each element.

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