

## Spring 2021 Final exam short answer questions

### True or False

1. It is a good practice to set data members to be private and method members to be public.
2. Since every hare is an animal, we can design hare as a superclass of animal.
3. Given string countries[] = {"US", "Canada", "China"}; then countries[1].size() returns 6.
4. Given an array arr of double, arr + 2 \* sizeof(double) is the address of arr[2].
5. In a class, all data members need to have the same type.
6. int\* a = new double; is a valid statement.
7. A class is a blueprint from where objects are made.
8. Suppose SurveyQuestion is a subclass of Question. Then SurveyQuestion \*q = new Question; is an invalid statement.
9. The condition to represent that age is not in the range of [0, 120] is (age < 0 && age > 120).
10. Codes in the loop body of for-statement run at least once.

### Multiple Choice Problem or Short Answer Question

1. Given a two-dimensional array strs of strings with the following contents { {"hello", "hi", "how are you?"}, {"you", "her", "him"}, {"laugh", "giggle", "smile"} }, what is the value of strs[2][1]?
2. How many elements are in vector vect after the following statements?  

```
vector<int> vect(3);  
vect.push_back(3);  
vect.push_back(1);  
vect.pop_back();  
vect.push_back(2);
```
3. How many times we enter the loop?  

```
int i = 0;  
while (i < 5)  
    i += 2;
```
4. In the following code, when you enter 9 for variable hour, what will be the output? Assume that hour and time are properly declared.  

```
if (hour < 18)  
{ time = "afternoon";}  
else if (hour < 12)  
    { time = "morning";}  
else if (hour < 6)  
    { time = "night";}  
else { time = "evening";}
```

5. Suppose `id_generator` is static data members in class `Computer`.

```
class Computer {  
    // Objects With Unique ID's:  
    private:  
        static int id_generator;  
        int id;  
    public:  
        Computer()  
        {  
            id = id_generator;  
            id_generator++;  
        }  
        int get_id() const  
        {  
            return id;  
        }  
};
```

```
int Computer::id_generator = 1;
```

Suppose in main function, we create three computer objects, what is the id of the **second** computer?

6. Suppose string `str` has value "abc", then `str.substr(2) + str[0]` returns ...

7. Suppose the header of function `display_lines()` is as follows.

```
void display_lines();
```

How to call this function properly?

- (A) `cout << display_lines();`
- (B) `display_line;`
- (C) `display_lines();`
- (D) `display_lines(5);`

8. Suppose we have the following method.

```
void move() {  
    int index = rand() % length;  
    position += pattern[index];  
}
```

Suppose the current value of data member `position` is 7, and data member `pattern` is an array with values [1, 0, 2]. Suppose when we call `move` method, `rand()` returns 9. What is the value of `position` after this calling?

Note that `length` is a data member to record the number of elements of `pattern`.

9. What can we say about array?

- (A) We can add string "Hello" into an array of ints.
- (B) The number of elements of an array arr can be found by sizeof(arr).
- (C) The name of an array also implies the address of the first element of that array.
- (D) Elements of an array can reside in non-consecutive memory space.

10. What is **NOT** correct for constructors of a class?

- (A) We can have more than one constructor as long as the parameter lists are different.
- (B) Constructor is to initialize data members of that class.
- (C) Constructor must have exact the same name as that of a class.
- (D) Return type of a constructor is void.

11. What is shipping charge for New York, a state of USA, according to the following logic?

```
double shipping_charge = 5.00;
if (country == "USA")
{
    if (state == "HI")
        shipping_charge = 10.00;
}
else
    shipping_charge = 20.00;
```

12. What is the header of a non-default constructor of class Dog?

- (A) Dog(string breed)
- (B) Dog()
- (C) Dog(string breed) const
- (D) ~Dog()

13. What is the output of the following code?

```
string strs[] = {"a", "b", "c", "d"};
string* p = strs;    //if it were int* p = strs; code will not be compiled.
p += 1;
What is the contents of *p?
```

14. What is the proper way to declare that SurveyQuestion is subclass of Question?

- (A) class Question : SurveyQuestion
- (B) class SurveyQuestion : public Question
- (C) class SurveyQuestion : Question
- (D) class Question : public SurveyQuestion

15. What is the value of  $1 / 3 * 3$  ?