

1. The type of `3ul` is

- (a) unsigned long long
- (b) long long
- (c) unsigned long
- (d) long

2. Given the following code:

```
struct S {  
    int x = 1; double y = 2.; float c = 3.f;  
} a ;  
auto [A , B , C] = a;
```

The types of A,B,C are

- (a) int,double,float
- (b) float,int,double
- (c) float,double,int
- (d) int,float,double

3. When you define a variable with type `bool`, what is the size of it?

- (a) 1 bit
- (b) 32 bits
- (c) 1 Byte
- (d) 4 Bytes

4. Assume that `x` is an unsigned short variable, what are the type of `x + 0`?

- (a) `int`
- (b) `unsigned int`
- (c) `short`
- (d) `unsigned short`

5. Where does a `cin` stop its extraction of data?

- (a) By seeing a blank space
- (b) By seeing (
- (c) By seeing a blank space or (

(d) By seeing <

6. What are the type of `std::cin` and the type of `std::cout`?(Make two choices respectively)

(a) `std::istream`

(b) `std::ostream`

(c) `std::cin`

(d) `std::cout`

(e) `std::ifstream`

(f) `std::ofstream`

(g) `std::istreamstream`

(h) `std::ostreamstream`

7. What will be the output of the following C++ code?

```
#include <iostream>
using namespace std;
int main() {
    std::string line;
    std::getline(cin, line, 't');
    cout << line;
    return 0;
}
```

The inputs are:

22342342s

dfhwoey

dddtr028y34t02ytywert

(a) 22342342s

(b) 22342342s

dfhwoey

dddtr028y34t02ytywert

(c) 22342342s

dfhwoey

ddd

(d) 22342342s
dfhwoey
ddddt

8. For a `std::vector<int> M`, the code `M.push_back(3)` is the same as
- (a) `M.insert(M.back() , 3)`
 - (b) `M.pop_back()`
 - (c) `M[M.size()] = 3, ++ M.size()`
 - (d) `M.insert(M.end() , 3)`
9. There is a set `std::set<int> S`, and there are some integers in it. Now, `auto x = S.find(1);`, what is the type of `x`?
- (a) `int`
 - (b) `std::set<int>::iterator`
 - (c) `std::set<int>::const_iterator`
 - (d) `std::iterator`
10. `std::string` also contains iterators. Based on your understanding of strings and iterators, what type of iterators do you think they belong to?
- (a) Forward iterators
 - (b) Bidirectional iterators
 - (c) Random-access iterators
 - (d) Input iterators
11. Explain the functionality and differences between `++i` and `i++`. Try to give an explanation why `x = ++i + i++` is an undefined behavior in C++.
12. Read the following program, what is the output with inputs below?

```
#include <iostream>
#include <iomanip>

int main() {
    double a, b;
    int c, d;
    std::cin >> a >> b;
    std::cin >> c >> d;

    std::cout << std::fixed << std::setprecision(5) << a << std::endl;
    std::cout << std::left << std::setw(10) << std::setfill('-') << a << b << std::endl;
}
```

```

    std::cout << c << "&" << d << std::endl;
    return 0;
}

```

The inputs are

```

122.3725 4443.125
123.4 555

```

13. Design a function `parseDouble`, change a string to a double number and return it if it contains a double number, other wise print **Parse Error!** to console and return 0. Here are some using examples of this function.

```

double parseDouble(std::string str);           // function declaration
void examples() {
    double x = parseDouble("1231231.333");      // x = 1231231.333
    double y = parseDouble("abcdddd");          // y = 0 print "Parse Error!"
    if (parseDouble("33333.33") > parseDouble("2222.92")) {
        std::cout << "true" << std::endl;      // print "true"
    } else {
        std::cout << "false" << std::endl;
    }
}

```

14. Assume that there is a map `std::map<std::string,int> S({"A",5})`. What will happen if you define `int& ref2 = (*S.begin()).second` and `std::string& ref1 = (*S.begin()).first`? Explain your result.
15. What will happen if you call `std::vector::reserve`? Does the size of the **vector** change or not? Do you think whether the iterators of the container will change or not when calling this function? Explain your answer.