

1. What is the output of the following C++ program?

```
#include <iostream>
using namespace std;
int main()
{
    int a = 9;
    double b = 5.2;
    float c = 29.5;
    string str = "C++";
    char ch = 'a';
    cout<<"a="<<a<<" b="<<b<<" c="<<c;
    cout<<" ch="<<ch<<" str="<<str<<endl;
    a = b;
    b = c;
    ch = ch + 3;
    cout<<"a="<<a<<" b="<<b<<" c="<<c;
    cout<<" ch="<<ch<<" str="<<str<<endl;
    return 0;
}
```

Handwritten annotations for the first program:

- Initial values: a=9, b=5.2, c=29.5, ch='a', str="C++"
- After `a = b;`: a=5.2, b=5.2, c=29.5, ch='a', str="C++"
- After `b = c;`: a=5.2, b=29.5, c=29.5, ch='a', str="C++"
- After `ch = ch + 3;`: a=5.2, b=29.5, c=29.5, ch='d', str="C++"

2. What is the output of the following program?

```
#include <iostream>
using namespace std;
int main(){
    int x = 5, y=5, z;
    x = ++x;
    y = --y;
    z = x + ++x;
    cout<<x<<" "<<y<<" "<<z;
    return 0;
}
```

Handwritten annotations for the second program:

- Initial values: x=5, y=5, z=
- After `x = ++x;`: x=6, y=5, z=
- After `y = --y;`: x=6, y=4, z=
- After `z = x + ++x;`: x=6, y=4, z=13

3. What is the output of the following program?

```
#include<iostream>
using namespace std;

int main()
{
    int x = 10;
    int& ref = x;
    ref = 20;
    cout << "x = " << x << endl;
    x = 30;
    cout << "ref = " << ref << endl;
    return 0;
}
```

x 10 ref

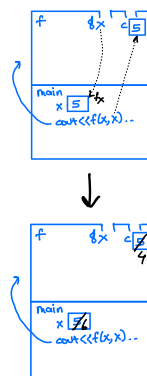
x = 20

ref = 30

4. What is the output of the following program?

```
#include <iostream>
using namespace std;
int f(int &x, int c) {
    c = c - 1;
    if (c == 0)
        return 1;
    x = x + 1;
    return x + c;
}

int main(){
    int x = 5;
    cout<<f(x, x)<<endl;
    cout<<x<<endl;
    return 0;
}
```



OUTPUT: 10

5. Choose the right option.

```
int* x, y; → int* x;
              int y;
```

- x is a pointer to an integer, and y is an integer
- Both x and y are pointers to an integer
- y is a pointer to an integer, and x is an integer

6. Which of the following is illegal?

- a. `int *px;`
- b. `int *px = 10;`
- c. `int x, *y;`
- d. `int x=10; int* px=&x;`
- e. `int x=2; int* px=&x; *px = 20;`

*int *px = 10*
*int** *int*
TYPE MISMATCH

7. What is the output of the following program?

```
#include <iostream>
using namespace std;
```

```
int main(){
    int x = 90;
    int *y = &x;
    int &r = x;
    int* &p = y;
    cout<<r<<endl;
    cout<<*p<<endl;
}
```

