

NAME: FIRST LAST

SEAT 5 ROW

ES



NUMBER

5

1. (30 points) Answer the following questions.

(1) What is the value of  $6 / 5 * r * r * r$  when variable  $r$  is 2 in C++?

(2) Declare function `foo` whose input parameter is int and return is a string. You just need to write the function header, no implementation is needed.

(3) Write code to generate a random int in `[100, 300]`.

(4) Given array of strings as follows  
`string greetings[] = {"Hello", "Morning", "Hi"};`  
What is the value for `greetings[2].length()`?

(5) Suppose we generate `a.out`, and we would like redirect the input from console to a file called `data.txt`. What is the command?

(6) What is the output of the following code?

```
int value = 1;
for (int i = 1; i < 6; i += 2)
    value *= i;
```

```
cout << value;
```

(7) Write code to declare an array of int with size 100, call it **scores**. Initialize each element by 0.

(8) What is the output of the following code?

```
for (int i = 0; i < 3; i++)
{
    for (int j = 0; j < 3; j++)
        if (i % 2 == j % 2)
            cout << "X";
        else cout << "O";

    cout << endl;
}
```

(9) Write a condition to represent that both x and y are in the range of [0, 100], where both ends are included. Suppose x and y are properly declared and initialized.

\*(10) Suppose n is an int, write code to throw away its last digit? For example, suppose n is 21, after your code, n should be 2.

2. (30 points) Short answer questions

(2.1) Given three integers a, b and c, properly declared and initialized, write code to find out the largest number.



(2.2) Read codes and write output.

```
void foo(int& a, int& b);
```

```
int main()
```

```
{
```

```
    int a = 11;
```

```
    int b = 6;
```

```
    foo(a, b);
```

```
    cout << "a = " << a << endl;
```

```
    cout << "b = " << b << endl;
```



```
    int c = 8;
```

```
    int d = 2;
```

```
    foo(c, d);
```

```
    cout << "c = " << c << endl;
```

```
    cout << "d = " << d << endl;
```



```
    return 0;
```

```
}
```

```
void foo(int& a, int& b)
```

```
{
```

```
    int temp;
```

```
    if (a % b != 0)
```

```
    {
```

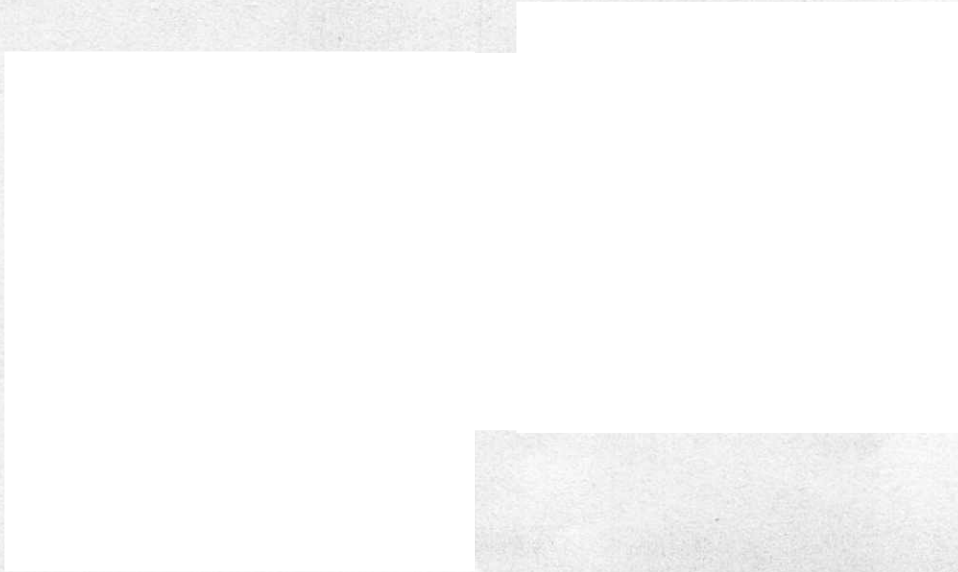
```
        temp = a;
```

```
        a = b;
```

```
        b = temp;
```

```
    }
```

```
}
```



(2.3) Read code and answer questions.

```
string foo(int num)
{
    string result = "";
    do {
        result = to_string(num % 2) + result;
        //to_string convert an int to the corresponding string
        num /= 2;
    } while (num != 0);

    return result;
}
```

What are the return for foo(6) and foo(8)?



3. (20 points) **Define a function**, for a given string `str`, return a string whose letters are the even-index letters in `str` with the same order. That is, suppose `str` is "abc", then return "ac".

4. (20 points) Write code inside main function, no need to include libraries.
- (1) Enter two numbers a and b, which can contain decimals
  - (2) If a is larger than or equal to b, then calculate and output to the screen result of  $\sqrt{a-b} + b^2$ .
  - (3) Otherwise, calculate and print  $\frac{a+5}{3(b-a)}$ .