19-12-24

MCQs (Functions in C)

1.

```
int fun(int x) {
        if (x == 0)
                return 1;
        return x * fun(x - 1);
}
int main() {
        printf("%d", fun(3));
}
```

A) 3
B) 6
C) 9
D) 1

2.

```
int test() {
        static int x = 5;
        x++;
        return x;
}
int main() {
        printf("%d ", test());
        printf("%d", test());
}
```

A) 5 5

B) 6 6
C) 6 7
D) Error

3.

```
void change(int x) {
        x = x + 5;
}
int main() {
         int a = 10;
        change(a);
        printf("%d", a);
}
```

A) 15
B) 10
C) 5
D) Error

4.

```
void modify(int *x) {
        *x = *x + 10;
}
int main() {
        int a = 5;
        modify(&a);
        printf("%d", a);
}
```

A) 5
B) 10
C) 15
D) Error

5.

```
int fun(int n) {
        if (n <= 1)
                return 1;
        return n + fun(n - 1);
}
int main() {
        printf("%d", fun(4));
}
```

A) 10
B) 9
C) 7
D) 24

6.

```
int f(int x) {
        return x++ + ++x;
}
int main() {
        int a = 5;
        printf("%d", f(a));
}
```

A) 11
B) 12
C) Undefined
D) 13

7.

```
void fun(int arr[]) {
```

```
    arr[1] = 100;
}
int main() {
    int a[3] = {10, 20, 30};
    fun(a);
    printf("%d", a[1]);
}
```

A) 20
B) 100
C) Garbage
D) Error

8.

```
int test(int x) {
    if (x == 0)
        return 0;
    return test(x / 2) + x % 2;
}
int main() {
    printf("%d", test(10));
}
```

A) 1
B) 2
C) 3
D) 4

9.

```
int fun(int x) {
    return x == 0 ? 0 : x + fun(x - 1);
}
```

```
int main() {
        printf("%d", fun(5));
}
```

A) 10
B) 15
C) 20
D) Error

10.

```
int test(int a, int b) {
        return a > b ? a : b;
}
int main() {
        printf("%d", test(7, 3));
}
```

A) 3
B) 7
C) 10
D) Error

Question and Answers

1. **What is a function in C? Explain its advantages.**

   - A function is a **self-contained block of code** that performs a specific task.
   - It can be **called multiple times** from different parts of a program.

   Advantages:

   - Code reusability
   - Modularity
   - Easy debugging and testing
   - Improves readability
   - Reduces program size

2. **What are the different types of functions in C?**

C functions are mainly classified into:

- **Library (Built-in) functions**
  - Predefined functions provided by C standard library
  - Example: printf(), scanf(), strlen(), sqrt()
- **User-defined functions**
  - Functions created by the programmer to perform specific tasks

3. **What is the difference between call by value and call by reference in C?**

Call by Value	Call by Reference
Copy of variable is passed	Address of variable is passed
Original value is not changed	Original value can be changed
Uses normal variables	Uses pointers

4. **What is recursion? What are its advantages and disadvantages?**

- Recursion is a technique where a function calls itself.
- Every recursive function must have a base condition to stop execution.

Advantages:

- Simplifies complex problems
- Useful for problems like factorial, Fibonacci, tree traversal

Disadvantages:

- Uses more memory (stack space)
- Slower than iteration
- Risk of stack overflow

5. **What is the role of a function prototype in C?**

- A **function prototype** declares the function before it is used.
- It informs the compiler about:

- Function name
- Return type
- Number and type of parameters

Benefits:

- Enables type checking
- Prevents function call errors