

Test questions

1. In the C++ memory model, the smallest addressable unit is:

- a) bit
- b) word
- c) byte
- d) int
- e) cell

2. The address of a memory cell is:

- a) its value
- b) its position in RAM
- c) its unique number
- d) always 4 bytes
- e) determined at runtime

3. Which of the following memory classes exists in C++?

- a) Automatic (stack)
- b) Global (static)
- c) Dynamic (heap)
- d) Stream
- e) All of the above

4. Which of the following is true about automatic variables?

- a) They are stored in the heap
- b) They exist until the block ends
- c) They can only be of integer type
- d) They are initialized automatically to zero
- e) They are always global

5. What will happen if you read an uninitialized local variable?

- a) 0 will be printed
- b) Compilation error
- c) Undefined behavior
- d) Runtime exception
- e) It will default to garbage

6. Which scope rule applies in C++?

- a) Most global wins
- b) Nearest declaration wins
- c) Variables can override global by name
- d) All scopes are merged
- e) Variables can be accessed before declaration

7. What is the output?

```
int x = 0;
int main() {
    int x = 1;
    std::cout << x << '\n';
}
```

- a) 0
- b) 1
- c) Both 0 and 1
- d) Compile error
- e) Undefined

8. Which keyword is used to access a global variable hidden by a local one?

- a) global
- b) extern
- c) static
- d) :: (scope resolution)
- e) const

9. Which of these variables has global lifetime?

- a) `int x = 0;` inside `main`
- b) `static int y;` inside a function
- c) `extern int z;` outside any function
- d) `int w = 5;` outside any function
- e) b + d

10. What is the output?

```
int x = 0;
int main() {
    int x = 1;
    {
        int x = 2;
        std::cout << x;
    }
}
```

- a) 0
- b) 1
- c) 2
- d) Error
- e) Undefined

11. Which statement about `const` variables is true?

- a) Must be initialized
- b) Cannot be modified
- c) Stored in read-only memory
- d) Can be pointers
- e) All of the above

12. Which qualifier prevents compiler optimizations?

- a) static
- b) const
- c) register
- d) volatile
- e) extern

13. Which is NOT a valid storage class in C++?

- a) auto

- b) register
- c) global
- d) static
- e) extern

14. Which of these are true about global variables?

- a) Exist during program lifetime
- b) Declared outside any function
- c) Can be hidden by locals
- d) Accessible using ::
- e) All of the above

15. What happens if you declare `extern int x;` inside a function?

- a) Defines `x` locally
- b) Declares `x` but not defines
- c) Initializes `x` to zero
- d) Hides global `x`
- e) Causes compile error

16. Which of the following is correct initialization?

- a) `int x = 5;`
- b) `int y(5);`
- c) `int z{5};`
- d) `int w{};`
- e) All of the above

17. Which of the following results in UB?

- a) Using an uninitialized variable
- b) Division by zero
- c) Buffer overflow
- d) Shifting negative numbers
- e) All of the above

18. Which of these is stack memory?

- a) Local int in function
- b) Global variable
- c) Array from `new`
- d) Static variable
- e) Thread local

19. Which variable declaration is invalid?

- a) `int x;`
- b) `float y = 1.5;`
- c) `const int z;`
- d) `char t{'@'};`
- e) `short s = 1;`

20. Which memory type is manually managed?

- a) Stack
- b) Heap
- c) Global

- d) Static
- e) Register

21. Which output is correct?

```
int x = 0;
int main() {
    std::cout << ::x;
}
```

- a) 0
- b) Undefined
- c) Compile error
- d) Garbage
- e) 1

22. Which type of memory is allocated before `main()` starts?

- a) Heap
- b) Stack
- c) Static/global
- d) Thread
- e) Register

23. Which of these is true about blocks `{ }` in C++?

- a) They cannot contain other blocks
- b) They define variable scope
- c) They always allocate heap memory
- d) They delete variables explicitly
- e) They can only appear in loops

24. What happens here?

```
int main() {
    int x = 5;
    {
        int y = x * 2;
    }
    std::cout << y;
}
```

- a) Prints 10
- b) Prints 0
- c) Compile error
- d) Undefined
- e) Prints garbage

25. Which statement about variables is false?

- a) They have type, name, storage, scope
- b) Uninitialized variables are safe
- c) Globals exist for entire program
- d) Automatic variables are stack-based
- e) `const` forbids modification

Отлично ⚡ понял тебя:

- Нумерация продолжится с **25**
- Вопросы будут не только теоретические, но и на **код с выводом**
- Темы: короткая логика (&&, ||), префиксный/постфиксный ++ --, условия, while

25. What is the output?

```
int a = 0;
if (a++)
    std::cout << "Yes";
else
    std::cout << "No";
```

26. What is the output?

```
int a = 1;
if (++a > 1)
    std::cout << a;
else
    std::cout << 0;
```

- a) 1
- b) 2
- c) 3
- d) 0
- e) Compile error

27. What is the output?

```
int x = 5;
while (x-- > 3) {
    std::cout << x << " ";
}
```

28. What is the output?

```
int x = 0;
while (x < 3) {
    std::cout << ++x << " ";
}
```

- a) 0 1 2
- b) 1 2 3
- c) 0 1 2 3
- d) 1 2
- e) Compile error

29. What is the output?

```
int x = 0;
while (x++ < 3) {
    std::cout << x << " ";
}
```

30. What is the output?

```
int x = 1, y = 0;
if (x && y++)
    std::cout << y;
else
    std::cout << x + y;
```

- a) 0
- b) 1
- c) 2
- d) Undefined
- e) Compile error

31. What is the output?

```
int a = 0;
int b = 2;
if (a || ++b)
    std::cout << b;
else
    std::cout << a;
```

32. What is the output?

```
int n = 3;
while (--n) {
    std::cout << n << " ";
}
```

- a) 3 2 1
- b) 2 1
- c) 2 1 0
- d) Infinite loop
- e) None

33. What is the output?

```
int i = 0;
while (i++ < 2) {
    std::cout << i << " ";
}
```

34. What is the output?

```
int i = 0;
while (++i < 3) {
    std::cout << i << " ";
}
```

35. What is the output?

```
int x = 1, y = 1;
if (++x && y--)
    std::cout << x + y;
else
    std::cout << x - y;
```

36. What is the output?

```
int a = 5;
int b = a++ + ++a;
std::cout << b;
```

- a) 10
- b) 11
- c) 12
- d) 13
- e) Undefined

37. What is the output?

```
int a = 1;
int b = 2;
while (a < b && b--) {
    std::cout << b << " ";
}
```

38. What is the output?

```
int i = 0;
while (i < 3) {
    if (i++ % 2 == 0)
        std::cout << i << " ";
}
```

39. What is the output?

```
int a = 0, b = 0;
if (a++ || b++)
    std::cout << a << b;
else
    std::cout << b << a;
```

40. What is the output?

```
int i = 5;
while (i-- > 0) {
    if (i % 2 == 0)
        std::cout << i << " ";
}
```

41. What is the output?

```
int a = 1;
int b = 1;
if (--a && b--)
    std::cout << "Yes";
else
    std::cout << "No";
```

42. What is the output?

```
int x = 2;
int y = (x > 1 ? ++x : x--);
std::cout << y;
```

43. What is the output?

```
int a = 0;
if (a++ && ++a)
    std::cout << a;
else
    std::cout << ++a;
```

44. What is the output?

```
int n = 0;
while (n < 5) {
    if (n++ % 2)
        std::cout << n;
}
```

- a) 1 3 5
- b) 2 4
- c) 1 2 3 4 5
- d) 3 5
- e) None

45. What is the output?

```
int a = 2;
int b = 3;
if (a++ > 2 || --b < 3)
    std::cout << a << b;
else
    std::cout << b << a;
```

46. What is the output?

```
int i = 0;
while (i++ < 5 && i < 3) {
    std::cout << i << " ";
}
```

47. What is the output?

```
int i = 3;
while (--i) {
    std::cout << i;
}
```

48. What is the output?

```
int x = 1;
if (x++ && x++)
    std::cout << x;
else
    std::cout << --x;
```


49. What is the output?

```
int i = 0;
while (i < 5) {
    std::cout << i++ * 2 << " ";
}
```

50. What is the output?

```
int a = 2, b = 2;
if (--a || b--)
    std::cout << a + b;
else
    std::cout << b - a;
```