Exam 1 Questions

CSE 232 (Introduction to Programming II)

1. If a char variable named c is declared, what is the type of the expression &c?

   (a) char
   (b) char *
   (c) char &
   (d) & char
   (e) None of the choices

2. What is the type of x in the following code?

```
std::string const s{"Green"};
auto x = s.at(1);
```

   (a) std::string
   (b) std::string const
   (c) char
   (d) char const

3. Which of the following is FALSE about initializations?

   (a) Initialization should be done to avoid undefined behavior
   (b) Initialization needs to be made before a variable is used
   (c) Initialization can use an equal sign, curly brackets, or parentheses
   (d) Initialization must use a literal value

4. Which of the following should be used to invoke (or call) a function MyFunction with no arguments provided?

   (a) void MyFunction
   (b) MyFunction(void)
   (c) void MyFunction()
   (d) MyFunction()
   (e) MyFunction

5. Which of the following is NOT a binary operator?

   (a) --
   (b) -=
   (c) <=
   (d) >>
   (e) ==

6. When can syntax errors occur?

   (a) During runtime
   (b) During compile time
   (c) During both runtime or compile time
   (d) During undefined behavior
   (e) None of the choices

7. What is the output of the following code?

```
char c = ’x’;
char *ptr = &c;
ptr++;
cout << *ptr;
```

   (a) x
   (b) y
   (c) Compile time error
   (d) Undefined behavior
   (e) None of the choices

8. What is the output of the following code?

```
const char* c = "Sparty";
for (int i = 0; i < strlen(c); i++)
{
 cout << i;
}
```

   (a) 01234
   (b) 12345
   (c) 012345
   (d) 123456

9. What is the difference between the following two loops?

```
int i = 0;
do {
 i = 9;
 ...
 ++i;
}
while (i < 9);
```

And

```
int i = 0;
while (i < 9) {
 i = 9;
 ...
 i++;
}
```

   (a) They are functionally identical
   (b) The number of iterations are different
   (c) The values of the two `i`'s are different at the end of each iteration
   (d) The scope of `i` is different
   (e) (b) and (c)

10. What is the output of the following?

```
cout << 15 / 2;
```

   (a) `15`
   (b) `7`
   (c) `7.5`
   (d) `8`
   (e) Depends on the type of 15 and 2

11. What is the return type for a function that does not have a `return` statement?

   (a) `void`
   (b) `null`
   (c) `None`
   (d) Nothing, the return type is omitted

12. What is the output of the following code?

```
string s{"bananas"};
auto x = s.find(’a’, 2);
cout << x;
```

   (a) `1`
   (b) `2`
   (c) `3`
   (d) `1, 3`
   (e) `3, 5`

13. What is the missing line in the code below, so that it outputs `"arthur"`?

```
string s{"Paarthurnax"};
//missing code
cout << x;
```

   (a) `auto x = s.substr(2, 8);`
   (b) `auto x = s.substr(2, 7);`
   (c) `auto x = s.substr(2, 6);`
   (d) `auto x = s.substr(3, 9);`
   (e) `auto x = s.substr(3, 8);`

14. When should you use pointers instead of references?

   (a) When you need to perform pointer arithmetic
   (b) When a library function you need requires a pointer argument
   (c) When you need to store the address of an object
   (d) All of the choices
   (e) None of the choices

15. When will a variable no longer be accessible by its name?

   (a) After the variable is reinitialized
   (b) After the variable is used
   (c) After the variable is assigned a new value
   (d) All of the choices
   (e) None of the choices

16. When would the two indexing methods `[]` and `at()` are likely to exhibit different behaviors?

    (a) When the code is in the main function
    (b) When the index is zero
    (c) When the index is out of bounds
    (d) When the element is copied
    (e) When the container is very large

17. Which variables are in scope at the comment?

```
int x = 23;
for (int i = 0; i < x; i++) {
 char c = ’a’ + x + i;
 {
  //here
 }
}
```

    (a) `x`
    (b) `i`
    (c) `c`
    (d) `x` and `i`
    (e) `x`, `i`, and `c`

18. What is the type of `x` in the following code?

```
const string s = "MSU";
const string * const ptr = &s;
auto y = *ptr;
auto x = &y;
```

    (a) `string`
    (b) `string *`
    (c) `const string *`
    (d) `const string &`

19. Which of the following statements would cause `x` to hold the integer stored in the memory position pointed at by a pointer at address `0x01a`?

    (a) `int x = 0x01a;`
    (b) `int *ptr = 0x01a; int x = *ptr;`
    (c) `int *ptr = 0x01a; int *x = &ptr;`
    (d) `int *ptr = 0x01a; int &x = ptr;`

20. What is `str` in the following statement?

```
const string *str;
```

    (a) A pointer to a string
    (b) A constant pointer to a string
    (c) A pointer to a constant string
    (d) A constant pointer to a constant string
    (e) None of the choices

21. What member function is used to add an element to the end of a vector?

    (a) `add`
    (b) `append`
    (c) `assign`
    (d) `extend`
    (e) `push_back`

22. What is not included when initializing a variable?

    (a) The variable’s name
    (b) The variable’s type
    (c) The variable’s value
    (d) None of the choices

23. Which of the following statements will print the `address` of a string, given the following code?

```
string str1{"CSE232"};
string & str2{str1};
string * str3{&str1};
```

    (a) `cout << str1;`
    (b) `cout << str2;`
    (c) `cout << str3;`
    (d) `cout << *str2;`
    (e) `cout << *str3;`

24. Given the code below:

```
int x = 17;
int *y = &x;
int *z = &x;
x = 39;
*y = 8;
*z = 39;
```

Which of the following lines would produce the same outputs?

```
cout << x; //Line 1
cout << y; //Line 2
cout << z; //Line 3
```

(a) `Lines 1 and 2`
(b) `Lines 2 and 3`
(c) `Lines 1 and 3`
(d) `Lines 1, 2, and 3`
(e) None of the choices

25. What is the difference between the following two loops?

```
for (int i = 0; ++i < 7;) {
 //some code
}
```

And

```
for (int i = 0; i++ < 7;) {
 //some code
}
```

(a) They are functionally identical
(b) Top loop will run an additional iteration
(c) Bottom loop will run an additional iteration
(d) Both loops will generate a syntax error due to missing an update clause

26. Which cluase in a for loop will execute immediately after a `continue` statement?

```
for (Initialization; Condition;
Update) {
 //first line
 //some code
 //last line
}
```

(a) Initialization
(b) Condition
(c) Update
(d) First line
(e) Last line

27. Which variables have the same address as `a` in the following code?

```
int a = 11;
auto b = a;
const auto c = a;
auto &d = a;
const auto &e = a;
```

(a) `b`
(b) `b` and `c`
(c) `b` and `d`
(d) `c` and `e`
(e) `d` and `e`

28. Which of the following statements would generate a syntax error?

(a) `int x = 5;`
(b) `int x = (5);`
(c) `int x{5};`
(d) None of the choices

29. What is the output of the following code?

```
char arr[] = {'a', 'b', 'c'};
char * ptr{&arr[1]};
cout << *ptr;
```

(a) `1`
(b) `a`
(c) `b`
(d) `c`
(e) Memory address

30. Given the declaration of the function `SomeFunc` below, which parameters will result in copying a string, when `SomeFunc` is called?

```
void SomeFunc(string * a, string &
b, string c);
```

(a) `a`
(b) `b`
(c) `c`
(d) `a` and `c`
(e) `b` and `c`

31. What happens when a `vector<int> v` is accessed past its rightmost index?

(a) `0` is returned
(b) `v`'s capacity is dynamically adjusted
(c) Exception is raised
(d) Undefined behavior occurs
(e) Compile error occurs

32. What is the difference between the following two loops?

```
// For loop
for (int i = 0; i < 11; ++i) {
 cout << i;
}

// While loop
int j = 0;
while(j < 11) {
 cout << j;
 j++;
}
```

(a) The for loop will run for an additional iteration if a break is added to both
(b) The scope of `i` is confined within the loop
(c) In each iteration, `i` will have a different final value from `j`
(d) The for loop does not output a `0` on the first iteration
(e) (c) and (d)

33. What is the type of `x` in the following code?

```
auto x = ’c’ - 1;
```

(a) char
(b) string
(c) int
(d) double
(e) This assignment is not possible

34. What is the output of the following code?

```
char c = ’x’;
cout << c--;
```

(a) `x`
(b) ASCII value of `x`
(c) `w`
(d) ASCII value of `w`
(e) Performing `c--` is not possible

35. Given a positive integer `x` that is at least 3 digits long, which of the following statements would return its third least significant digit?

The least significant digit (LSD) is the digit in a number that has the lowest power of the base, and is located on the rightmost side.

(a) `(x / 10) % 100`
(b) `(x / 100) % 10`
(c) `(x % 10) / 100`
(d) `(x % 100) / 10`

36. Given an integer `y`, which of the following is equivalent to `int const x{y};`?

(a) `const int x{y};`
(b) `const int x = y;`
(c) `int const x = y;`
(d) All of the choices are equivalent

37. If the following code outputs 3, which binary operators should '?' be replaced with?

```
int p = 5;
int q = 2;
cout << ((p ? q) * q) - (p ? q);
```

(a) %, *
(b) /, %
(c) *, *
(d) /, *
(e) /, /

38. What is the output of the following?

```
int x = 2;
double y = double(x / 4);
cout << y;
```

(a) 0
(b) 0.5
(c) 1
(d) 2
(e) 4

39. You are given the following function:

```
void Swap(int &a, int b) {
 int temp = a;
 a = b;
 b = temp;
}
```

What is the output of the following?

```
int x = 5, y = 3;
Swap(x, y);
cout << x << " " << y;
```

(a) 5 5
(b) 5 3
(c) 3 5
(d) 3 3
(e) Compile error

40. You are given the following:

```
int a = 42;
int* getPtr() {
 return &a;
}
```

What is the output of the following?

```
int *ptr = getPtr();
cout << *ptr;
```

(a) 42
(b) Compile error
(c) Undefined behavior
(d) Memory address