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{"owlbear"};
auto x = s.at(1);
```

   (a) `std::string`
   (b) `std::string &`
   (c) `std::string const`
   (d) `char`
   (e) `char &`
   (f) `char const`

3. Which of the following is `FALSE` about initializations?

   (a) Initialization is recommended 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
   (e) All statements are true

4. Which of the following invokes a function `MyFunction` with no arguments provided?

   (a) `void MyFunction`
   (b) `MyFunction(void)`
   (c) `void MyFunction()`
   (d) `MyFunction()`
   (e) `MyFunction`
   (f) `MyFunction(NULL)`

5. What is the out of the following code?

```
for (unsigned i = 4; i >= 0; i--) {
 cout << i;
}
```

   This question was dropped

   (a) `43210`
   (b) `4321`
   (c) `3210`
   (d) `321`
   (e) None of the choices

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 = 'a';
char *p = &c;
p++;
cout << *p;
```

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

8. What is the output of the following code?

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

   (a) `01234`
   (b) `12345`
   (c) `012345`
   (d) `123456`
   (e) `"CSE232"` cannot be stored this way

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

```
int i = 0;
do {
 i = 5;
 //some code
 ++i;
}
while (i < 5);
```

And

```
int i = 0;
while (i < 5) {
 i = 5;
 //some code
 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)
(f) (c) and (d)

10. What are the possible ways of creating a C string?

(a) `char str[] = "sweetroll";`
(b) `const char str[] = "sweetroll";`
(c) `char str[9] = "sweetroll";`
(d) (a) and (b)
(e) All of the choices

11. For which values of `int x` will the following expression by true?

```
-5 <= x < -2
```

(a) `-5, -4, -3, -2`
(b) `-5, -4, -3`
(c) `-4, -3, -2`
(d) None exist
(e) All possible values of `x`

12. What is the output of the following code?

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

(a) `0`
(b) `2`
(c) `4`
(d) `0, 2`
(e) `0, 4`
(f) `0, 4, 6`

13. What is the missing 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);`
(f) `auto x = s.substr(3, 7);`

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. What is the missing in the code below, so that it outputs 10?

```
int x = 10;
double d;
//missing code
cout << d;
```

(a) `d = static_cast<double>(x);`
(b) `d = static_cast<int>(x);`
(c) `d = (double)x;`
(d) `d = (int)x;`
(e) (a) and (c)
(f) All of the choices

16. What is the equivalent expression for the following code?

```
c = this(a);
if (c) {
 c = that(b);
}
```

(a) `c = (this(a) && that(b));`
(b) `c = (this(a) || that(b));`
(c) `c = (this(a), that(b));`
(d) None of the choices

17. Which variables are in scope at the comment?

```
int x = 5;
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`
(f) None of the choices

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

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

(a) `string`
(b) `string *`
(c) `const string`
(d) `const string *`
(e) `string &`
(f) `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 *y = 0x01a; int x = *y;`
(c) `int *y = 0x01a; int *x = &y;`
(d) `int *y = 0x01a; int &x = y;`

20. What is `str` in following statement?

```
const string *x;
```

This question was dropped

(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. Which of the following statements would copy the value of string `y` to `x`?

(a) `string &x = y;`
(b) `const string &x = y;`
(c) `string *x = &y;`
(d) `const string *x = &y;`
(e) None of the choices

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. Can you declare a reference?

    This question was dropped

    (a) Yes
    (b) No
    (c) Depends on if the reference is const
    (d) Depends on if the reference is for a fundamental type

24. Which variables have the same value in the following code?

```
int x = 13;
int *y = &x;
int *z = &x;
x = 30;
*y = 26;
*z = 30;
```

    (a) `x` and `y`
    (b) `y` and `z`
    (c) `x` and `z`
    (d) `x`, `y` and `z`
    (e) None of the choices

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

```
for (int i = 0; ++i < 5;) {
 //some code
}
```

    And

```
for (int i = 0; i++ < 5;) {
 //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
    (f) None of the choices

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

```
int a = 9;
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 = 8;`
(b) `int x = (8);`
(c) `int x(8);`
(d) `int x {8};`
(e) None of the choices

29. What is the output of the following code?

```
int x = static_cast<int>(0.5);
if (x = 0) {
 cout << "Here" << endl;
} else {
 cout << "There" << endl;
}
```

(a) `Here`
(b) `There`
(c) Undefined behavior
(d) Runtime error
(e) Compile error

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

```
void MyFunc(string * x, string & y,
string z);
```

(a) `x`
(b) `y`
(c) `z`
(d) `x` and `y`
(e) `y` and `z`
(f) `x`, `y` and `z`

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

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

32. What can be said about `x` and `y`, if the following is `true`?

```
x == y;
```

(a) The addresses of `x` and `y` are equal
(b) `x` and `y` have the same type
(c) Changes to `x` will also change `y`
(d) If `x` is const then `y` is a const as well
(e) None of the choices

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?

(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. What is the output of the following?

```
int x = 3;
double y = (int)2.5;
y += x++;
y *= 2;
cout << y / x;
```

(a) 2
(b) 2.5
(c) 2.75
(d) 3

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 = 7, y = 13;
Swap(x, y);
cout << x << " " << y;
```

(a) 7 7
(b) 7 13
(c) 13 7
(d) 13 13
(e) Compile error

40. You are given the following function:

```
int* getPtr() {
 int a = 11;
 return &a;
}
```

What is the output of the following?

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

(a) 11
(b) Compile Error
(c) Undefined Behavior
(d) Memory Address