Exam 2 Questions

CSE 232 (Introduction to Programming II)

1. If a string variable named `str` is declared, what is the type of the expression `&str`?

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

2. You are given the following function:

```
void SomFunc(int a, int b){
 cout << a << " and " << b;
}
```

   What is the output of the following?

```
int a = 5;
int b = 3;
SomFunc(a++, --b);
```

   (a) `5 and 3`
   (b) `5 and 2`
   (c) `6 and 3`
   (d) `6 and 2`
   (e) Undefined behavior

3. Given the following function declarations, which of the following overloaded functions are valid?

```
void Green();
int Green();

int White(string);
int White(int);

string Sparty(string s);
string Sparty();
```

   (a) `Green` is overloaded
   (b) `White` is overloaded
   (c) `Sparty` is overloaded
   (d) (a) and (c)
   (e) (b) and (c)

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

```
for (int i = 11; i > 0; --i){
 ...
}
```

   And

```
int i = 11;
while (i > 0){
 ...
 i--;
}
```

   (a) The two loops are identical
   (b) The values of the two `i`'s are different at the end of each loop iteration
   (c) The scope of `i` is different.
   (d) (b) and (c)

5. What is the correct way to declare a pointer to a char `c`?

   (a) `char *ptr = &c;`
   (b) `char &ptr = c;`
   (c) `char *ptr = c;`
   (d) `char ptr = *c;`
   (e) (a) and (b)
   (f) (b) and (c)

6. Which of the following correctly declares a vector of doubles?

   (a) `vector<double> v;`
   (b) `double vector v;`
   (c) `vector v<double>;`
   (d) `double v<vector>;`
   (e) `vector double v;`

7. What is the output of the following?

```
vector<char> v = {'H', 'O', 'W',
'D', 'Y'};
for (int i = v.size() - 1; i > 0 ;
i--) {
 cout << v.at(i) << " ";
}
```

   (a) H O W D Y
   (b) Y D W O H
   (c) Y D W O
   (d) D W O H
   (e) D W O

8. What is the missing line in the code below, so that it outputs 7?

```
class MyClass {
 public:
  int x;
  MyClass(int val) : x(val) {}
};

int main() {
 MyClass obj1(7);
 // Missing code
 cout << obj2.x;
 return 0;
}
```

   (a) `MyClass obj2 = obj1;`
   (b) `MyClass &obj2 = obj1;`
   (c) `MyClass *obj2 = &obj1;`
   (d) (a) and (b)
   (e) (b) and (c)
   (f) (a) and (c)

9. 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 = 13, y = 11;
swap(&x, y);
cout << x << " " << y;
```

   (a) 11 11
   (b) 11 13
   (c) 13 11
   (d) 13 13
   (e) Compile error

10. Which of the following is equivalent to `(*ptr).func();`?

   (a) `ptr.func();`
   (b) `*ptr.func();`
   (c) `*(ptr).func();`
   (d) `ptr->func();`
   (e) `*ptr->func();`

11. Your program consists of the following files:

```
main.cpp
foo.cpp
foo.h
bar.cpp
bar.h
```

   How would you complete the command `g++ -Wall -std=c++20` to compile your program?

   (a) `main.cpp foo.cpp foo.h bar.cpp bar.h`
   (b) `main.cpp foo.cpp bar.cpp`
   (c) `main.cpp foo.h bar.h`
   (d) `main.cpp`
   (e) Depends on the files

12. What of the following is the correct way of including a user-defined header file `commands`?

    (a) `#include <commands.h>`
    (b) `#include "commands.h"`
    (c) `#include commands.h`
    (d) (a) and (b)
    (e) (b) and (c)

13. Which of the following commands should be executed from the command line to redirect the contents of `a.txt` to be the input for `a.out`, and redirect the output from `a.out` into `b.txt`?

    (a) `./a.out < a.txt > b.txt`
    (b) `./a.out < b.txt > a.txt`
    (c) `a.txt > ./a.out > b.txt`
    (d) `b.txt < ./a.out < a.txt`
    (e) `a.txt < b.txt < ./a.out`
    (f) `b.txt > a.txt > ./a.out`

14. Which of the following is true about const functions?

    (a) A const function does not change the object the function belongs to
    (b) A const function can be called on a const object
    (c) A const function cannot be called on a non-const object
    (d) (a) and (b)
    (e) (b) and (c)
    (f) All of the choices

15. Which of the following is true about a member function that simply prints `GREETINGS!` to the command line?

    (a) It should have a return type
    (b) It should be a void function
    (c) It should be a const function
    (d) (a) and (c)
    (e) (b) and (c)

16. If a class requires a user-defined copy constructor, what else is almost always required to be user-defined?

    (a) A copy assignment operator
    (b) A move assignment operator
    (c) A move constructor
    (d) A destructor
    (e) (b) and (c)
    (f) (a) and (d)
    (g) All of the choices

17. Which of the following is not true?

    (a) `operator<<` works with `istream`
    (b) `operator>>` works with `ostream`
    (c) `operator<<` works with `ostream`
    (d) `operator>>` works with `istream`
    (e) (a) and (b)
    (f) (c) and (d)

18. When should `fstream` be used?

    (a) Reading from and writing to the terminal
    (b) Reading from and writing to files
    (c) IO redirection
    (d) All of the choices

19. What does the command `git init` do when executed from the command line?

    (a) Initializes a new branch in the current git repository
    (b) Initializes a new commit to the current git repository
    (c) Initializes the current working directory a git repository
    (d) Initializes a new pull request in the current git repository

20. Which of the following git commands is used to download commits from a remote repository into an existing local repository?

    (a) `git clone`
    (b) `git pull`
    (c) `git init`
    (d) (a) and (b)
    (e) All of the choices

21. Which of the following statements is true?

    (a) A local repository can exist without a remote repository
    (b) A remote repository can exist without a local repository
    (c) Changes made to remote repository are automatically synced with local repository
    (d) (a) and (b)
    (e) (b) and (c)
    (f) All statements are true

22. Which of the following is an example of a valid `HTTPS URL` of a repository?

    (a) `https://github.com/user/project.git`
    (b) `git@github.com:user/project.git`
    (c) `https://github.com/user/project`
    (d) (a) and (b)
    (e) (b) and (c)
    (f) All of the choices

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

```
const char* c = "MSU";
auto x = c[1];
```

    (a) `char`
    (b) `const char`
    (c) `string`
    (d) `const string`
    (e) `"MSU"` cannot be stored this way

24. Which of the following is an example of a multi-line comment in `C++`?

    (a) `\\Commented text`
    (b) `// Commented text`
    (c) `# Commented text`
    (d) `<!-- Commented text -->`
    (e) `\* Commented text *\`
    (f) `/* Commented text */`

25. If `x` is a reference, how do you access its value?

    (a) `x`
    (b) `&x`
    (c) `*x`
    (d) None of the choices

26. How many arguments does a default constructor take in?

    (a) No argument
    (b) One argument
    (c) At least one argument
    (d) Depends on the class

27. How many constructors can a class have?

    (a) None
    (b) Exactly one
    (c) One or more
    (d) At most one

28. You have a function that takes a vector of integers `v` and an index `i` as function parameters, and returns the value stored in `v` at the index `i`. Which of the following exceptions should you check for (and throw) in this function?

    (a) `logic_error`
    (b) `invalid_argument`
    (c) `domain_error`
    (d) `length_error`
    (e) `out_of_range`

29. Which of the following is an advantage of using assertions over exceptions?

    (a) Assertions can be easily turned off
    (b) Assertions can be used in compile-time, unlike exceptions
    (c) Assertions are more optimized than exceptions
    (d) All of the choices
    (e) None of the choices

30. Which of the following commented lines can `var` not be accessed from?

```
for (;;) {
 string var;
 // Label A
 while (x.length() < 3) {
  // Label B
 }
 // Label C
}
// Label D
```

(a) Label A
(b) Label B
(c) Label C
(d) Label D
(e) It can be accessed from everywhere

31. If the following line of code does not cause a compiler error, which of the following is a valid type for `x`?

```
const int y = x[0];
```

(a) `const vector<int>`
(b) `vector <const int>`
(c) `vector <double>`
(d) All of the choices

32. Consider the following code:

```
const MyClass someObj;
```

Which of the following member functions cannot be called on `someObj`, assuming the functions do exactly as their names imply, and nothing else?

(a) `getValue`
(b) `setValue`
(c) `printValue`
(d) (a) and (b)
(e) All of the choices

33. What makes a `const MyClass *` different from a `MyClass *`?

(a) A `const MyClass *` cannot change the object it points to
(b) A `const MyClass *` cannot change to point at a different object
(c) They are identical
(d) A `const MyClass *` must be initialized, not just declared

34. Which of the following is true about assertions?

(a) They can generate run-time errors
(b) They can generate compile-time errors
(c) They are part of the <assert> library
(d) None of the choices

35. Which git command is used to send a local repository's commits to a remote repository?

(a) `git add`
(b) `git commit`
(c) `git fetch`
(d) `git pull`
(e) `git push`

36. A const member function has what property that distinguishes it from a non-const member function?

(a) It can be called on const objects
(b) It has only const parameters
(c) It returns a const object
(d) It returns a reference to a const object
(e) All of the choices

37. What is the purpose of header guards?

(a) To allow for faster compilation
(b) To allow templates to be instantiated
(c) To avoid redeclaration/redefinition errors
(d) To ensure that a class's privacy is maintained
(e) All of the choices

38. You have a class `MyClass` with a member function `run` that does not take any function parameters. Now, what is the missing line in the code below that calls the function `run`?

```
MyClass o;
//missing code
```

(a) `run;`
(b) `run();`
(c) `MyClass.run;`
(d) `MyClass.run();`
(e) `o.run;`
(f) `o.run();`

39. In the code below, what is the initial value of `i` in debugging mode if the breakpoint is set at the line of the comment?

```
for(int i = 10; i >= 5; i--){
 cout << i; //Breakpoint here
}
```

(a) 0
(b) 5
(c) 9
(d) 10
(e) Undefined/Garbage

40. What is the missing line in the code below, so that the output is `HELLO`?

```
const char* c = "HELLO";
int i = 0;
//Missing code
{
 cout << c[i];
 i++;
}
```

(a) `while(i < c.size())`
(b) `while(i < size(c))`
(c) `while(c[i] != '\0')`
(d) `while(c[i] != '/0')`

string