

This pledged test is closed-book, closed-notes. All answers must be written on the answer sheet.

In the questions that follow you are sometimes asked to give the output of a code segment. If you believe the code segment does not produce any output, write NONE.

1. What is your intended major?
2. What base ten integer is represented by the eight bit two's complement number 01001011?
3. Write down the eight-bit, two's complement representation of the base ten number -47.
4. For each of the following C++ constant values identify its *base* and its *type*.
 - (a) 7L
 - (b) 00101100
 - (c) 800
 - (d) 0x98
 - (e) 17.4
5. Does a *syntax rule* or a *semantic rule* specify program form?
6. Does a *syntax rule* or a *semantic rule* specify program behavior?
7. Which one of the following is not a legal character for a C++ identifier?
 - (a) period
 - (b) uppercase alphabetic
 - (c) underscore
 - (d) uppercase alphabetic
 - (e) digit
8. True or False An object can have a value.
9. True or False An object can have member functions.
10. True or False The objects "1" and '1' have the same type.
11. True or False The ^ is the C++ exponentiation operator.
12. What return value(s) for functions `main()` and `ApiMain()` indicate success?
13. Suppose the following definitions are in effect.

```
int i = 8;
int j = 4;
float a = 1.0;
float b = 4.0;
```

For each of the following expressions give the computed value and its type.
 - (a) `j / i`
 - (b) `a / b`
 - (c) `4 % 3`
 - (d) `1 + 2 * 3`
 - (e) `4 / 8 * 2.0`

14. Indicate why the following statement is not a valid C++ expression.

```
[0 + 1 * (3 - 3) + 5] / 2
```

15. Give the preprocessor statement that allows a program to perform standard input and output requests.

16. True or False The following statements produce the same output.

```
cout << "1" << endl;
cout << '1' << endl;
cout << 1 << endl;
```

17. Suppose `i` is an `int` object. What must be true about `i` for the following statement not to compile?

```
i = 7;
```

18. Write a definition that initializes a string object `s` such that when it is displayed it produces a 1.

19. Write a statement that sends a message to `SimpleWindow` object `w` to display itself.

20. Write a statement that sends `RectangleShape` object `R` a message to display itself.

21. True or False The *and* operator has greater precedence than the *or* operator.

22. True or False The *not* operator has greater precedence than the *addition* operator.

23. True or False The relational operators have greater precedence than the logical operators.

24. Write a statement that decreases the value of object `k` by 1 without using the assignment operator `=`.

25. Name the three looping constructs in C++.

26. Name the two conditional constructs in C++.

27. In showing that a `for` statement can be rewritten as a code segment using a `while` statement, we surrounded our answer by matching curly braces. Why?

28. What do we call a loop that has a test expression that is always true?

29. Which parts of a `for` statement are optional?

30. What keyboard character indicates that there is no more input?

31. Suppose there are no more values available for extraction from the input stream `fin`. What is the output of the following code segment?

```
ifstream fin("scores.dat");
if (fin >> c1) {
    cout << 1 << endl;
}
else {
    cout << 2 << endl;
}
```

32. The action of a `for` statement executes a minimum of how many times?

33. Write a statement that extracts to object `c` the next nonblank character from the standard input stream.

34. Write a statement that extracts to object `c` the next character from the standard input stream.

35. What is the output of the following code segment?

```
int i = 2;
for (int i = 1; i <= 3; ++i) {
    int j = i;
}
cout << i << endl;
```

36. What is the output of the following code segment?

```
int i = 1;
int j = 2;
if (i == 0)
    if (j == 2)
        cout << 1 << endl;
else
    cout << 2 << endl;
```

37. What is the output of the following code segment?

```
int Counter1 = 0;
int Counter2 = 0;
int Counter3 = 0;
for (int i = 1; i <= 15; ++i) {
    ++Counter1;
    for (int j = 1; j <= 20; ++j) {
        ++Counter2;
    }
    ++Counter3;
}
cout << Counter1 << endl << Counter2 << endl << Counter3;
```

38. What is the output of the following code segment?

```
if (0 == 1 / 2)
    if (4 == 3)
        cout << 1 << endl;
    else if ((3 < 5) && (5 != 1 + 4))
        cout << 2 << endl;
    else
        cout << 3 << endl;
else
    cout << 4 << endl;
```

39. The following code segment will compile, but nonetheless it probably contains a programmer error. What is the likely error?

```
if (i = ListSize) {
    cout << "We are done" << endl;
}
else {
    cout << "We are not done" << endl;
}
```

40. Do the following two correct code segments have the same effect on the object P? If so, answer “yes”. If not, explain why.

```
(a)  if (m < 5) {
      if (n < 10) {
          P = true;
      }
      else {
          P = false;
      }
  }

(b)  if ((m < 5) && (n < 10)) {
      P = true;
  }
  else {
      P = false;
  }
```

41. Give a truth table for logical operands P, Q, and R. A table entry is true when P is true and Q is false. A table entry in the table is also true when P is false and Q and R have different values. The remaining table entries are all false.
42. Complete a program that performs the following task. A user is to be prompted for a integer value `sum` that is supposed to be in the interval 0 ... 24. If the value of `sum` is not in the proper interval, the only actions that should take place are displaying an error message and returning control back to the operating system. If the value for `sum` is in the proper interval, the user should be prompted for a number of dimes `d`, a number of nickels `n`, and a number of pennies `p`. If the monetary value of the coins provided by the user equals `sum`, display the message `yes`, otherwise display the message `no`.