



**READ THIS NOW!**

**Failure to read and follow the instructions below may result in severe penalties.  
Failure to adhere to these directions will not constitute an excuse or defense.**

- Print your name in the space provided below.
- Print your name and ID number on the Opscan form; be sure to code your ID number on the Opscan form. Code **Form A** on the Opscan; code your room **group** number: Nor 136, 8:00 am = 1, Nor 136, 11:00 am = 2, Squires Colonial, 8:00 am = 3.
- Choose the single best answer for each question — some answers may be partially correct. If you mark more than one answer, it will be counted wrong.
- Unless a question involves determining whether given C++ code is syntactically correct, assume that it is. The given code has been compiled and tested, except where there are deliberate errors. Unless a question specifically deals with compiler #include directives, you should assume the necessary header files have been included.
- Note that questions about printed values disregard formatting completely.
- Be careful to distinguish integer values from floating point (real) values (containing a decimal point). In questions/answers which require a distinction between integer and real values, integers will be represented without a decimal point, whereas real values will have a decimal point, [ 1044 (integer), 1044.0 (real)].
- When you have finished, sign the pledge at the bottom of this page and turn in the test and your Opscan.
- **This is a closed-book, closed-notes examination. No calculators or other electronic devices may be used during this examination. You may not discuss (in any form: written, verbal or electronic) the content of this examination with any student who has not taken it. You must return this test form when you complete the examination. Failure to adhere to any of these restrictions is an Honor Code violation.**
- There are 40, 2.5-point multiple-choice questions.
- The answers you mark on the Opscan form will be considered your official answers.

**Do not start the test until instructed to do so!**

**Print Name (Last, First)** \_\_\_\_\_

**Pledge:** On my honor, I have neither given nor received unauthorized aid on this examination.

\_\_\_\_\_  
*signature*

For the following 4 questions, select the value of the given C++ arithmetic expression. Note that the presence of a decimal indicates a double value, rather than an int.

|                     | 1    | 2   | 3      | 4    | 5                 |
|---------------------|------|-----|--------|------|-------------------|
| 1) $8 - 12 / 5$     | -0.8 | 0   | 6      | 5.6  | none of the above |
| 2) $14.0/3.0 + 5.0$ | 1.75 | 9   | 9.6667 | 10   | none of the above |
| 3) $3 \% 7 - 4$     | -4   | -1  | 0      | 1    | none of the above |
| 4) $4.2 - 3 * 2$    | -1.8 | 2.4 | 2.8    | 10.2 | none of the above |

For the next 3 questions, select the value logically assigned to the relevant variable, given the declarations:

```
int    intVar;
double floatVar;
```

|                                      | 1 | 2   | 3   | 4    | 5                 |
|--------------------------------------|---|-----|-----|------|-------------------|
| 5) <code>floatVar = 21 % 4;</code>   | 1 | 1.0 | 5   | 5.25 | none of the above |
| 6) <code>floatVar = 12 / 2.5;</code> | 4 | 4.0 | 5   | 5.0  | none of the above |
| 7) <code>intVar = 3 * 2.3;</code>    | 6 | 6.0 | 6.9 | 7    | none of the above |

For the next 4 questions, assume the variable declarations:

```
int    lucy = -1, linus, pigpen;
double snoopy, charlie ;
```

Consider each group of statements and mark:

- 1) if every statement in the group is syntactically **correct**
- 2) if there is at least one statement in the group that is syntactically **incorrect**
- 3) if there is not enough information to decide

(Assume that any necessary #include directives are present.)

8) `snoopy = 4.972;`  
`linus = snoopy--;`  
`charlie = linus * ++lucy;`

10) `snoopy = linus ++ pigpen;`  
`linus--;`

9) `charlie = 0 ;`  
`linus = 1;`  
`if (lucy + 5)`  
`snoopy = charlie;`  
`else`  
`snoopy = linus;`

11) `pigpen = 137;`  
`lucy = (pigpen <= 1);`

For the following 5 questions, suppose the (file) input stream `infile` contains the following 4 lines of data (there's several blank characters between columns and a newline character immediately after the last character on each line):

```

43  21  84  97  58
17  32  75  18  49
51  83  13  22  37
67  92   5  73  55

```

What is the value of each of the indicated variables after the execution of the following program segment?

```

int zero = 0, one = 1, two = 2, three = 3, four =4;

infile >> zero >> one >> zero >> two;
infile.ignore(100, '\n');
infile >> zero >> two ;
infile.ignore(100, '\n');
infile >> three >> three >> four;
infile.ignore(100, '\n');
infile.ignore(100, '\n');
if (!infile.eof()) infile >> one;

```

|           | 1  | 2  | 3  | 4  | 5                 |
|-----------|----|----|----|----|-------------------|
| 12) zero  | 17 | 43 | 84 | 97 | none of the above |
| 13) one   | 0  | 21 | 55 | 84 | none of the above |
| 14) two   | 17 | 32 | 84 | 97 | none of the above |
| 15) three | 18 | 49 | 51 | 75 | none of the above |
| 16) four  | 4  | 5  | 13 | 83 | none of the above |

For the next three questions, assume the input file stream `infile` is connected to an input file whose contents are:

```
4      25      37M8
```

(There's a single tab separating the '4' from the '2' and the '5' from the '3'.) Consider execution of the following code fragment immediately after the file stream has been opened:

```

int i1;
char ch1 = 'R', ch2 = 'S';
infile.get(ch1);
infile.get(ch2);
infile >> i1;
infile.get(ch1);
infile.get(ch2);
infile >> i1;

```

17) The resulting value of the variable `i1` would be:

- 1) 4
- 2) 2
- 3) 5
- 4) 3
- 5) 7
- 6) 8
- 7) 25
- 8) 37
- 9) none of these

18) The resulting value of the variable ch1 would be:

- 1) 'R'
- 2) '4'
- 3) '2'
- 4) '\\t'
- 5) '5'
- 6) '3'
- 7) '7'
- 8) 'M'
- 9) '8'
- 10) none of these

19) The resulting value of the variable ch2 would be:

- 1) 'S'
- 2) ' ' (a space)
- 3) '\\t'
- 4) '4'
- 5) '2'
- 6) '5'
- 7) '7'
- 8) 'M'
- 9) '8'
- 10) none of these

---

For the succeeding 2 questions, suppose the input file, input.dat contains the following data:

4 8 6 9 -5 2 7 18 -3

Consider executing the following program:

```
#include <iostream.h>
#include <fstream.h>
void main() {
    ifstream input;
    input.open("input.dat");
    int score1, score2, score3,
        average, total = 0;
    input >> score1 >> score2 >> score3;
    while (input) {
        average = (score1 + score2 + score3)/3;
        total = total + score1 + score2 + score3;
        cout << average << endl;
        input >> score1 >> score2 >> score3;
    }
    cout << total << endl;
    input.close( );
}
```

20) What is the value printed on the second line of output?

- 1) 2
- 2) 4
- 3) 6
- 4) 7
- 5) 11
- 6) none of the above

21) What is the value printed on the last line of output?

- 1) 7
- 2) 15
- 3) 21
- 4) 46
- 5) 58
- 6) none of the above

For the next three questions, assume the input file stream `infile` is connected to an input file whose contents are:

```
4      25      37M8
```

(There's a single tab separating the '4' from the '2' and the '5' from the '3'.) Consider execution of the following code fragment immediately after the file stream has been opened:

```
int i1;
char ch1 = 'R', ch2 = 'M', ch3 = 'S';
infile >> i1 >> ch1 >> ch2 >> ch3;
```

22) The resulting value of the variable `ch1` would be:

- 1) '4'
- 2) '\t'
- 3) '2'
- 4) '5'
- 5) ' ' (a space)
- 6) '3'
- 7) '7'
- 8) 'M'
- 9) '8'
- 10) none of these

23) The resulting value of the variable `i1` would be:

- 1) '\n'
- 2) '\t'
- 3) '2'
- 4) '5'
- 5) ' ' (a space)
- 6) '3'
- 7) '7'
- 8) 'M'
- 9) '8'
- 10) none of these

---

For the next 5 questions, assume the input file stream `rosebud` is connected to an input file whose contents are:

```
17 72.7 -8.3 12 0
4.2 -3 9 81.62 14
3 19.2 -5 -12.8 1
```

(There's a newline character at the end of each line, and a single space separating values on the same line.) Consider execution of the following code fragment immediately after the file stream has been opened:

```
int anInt1, anInt2;
float aFloat1, aFloat2, aFloat3;
rosebud >> aFloat1 >> anInt1;
cout << aFloat1 << " " << anInt1 << " ";
rosebud.ignore(4, '\n');
rosebud >> aFloat2;
rosebud.ignore( 80, '\n');
rosebud >> anInt2 >> aFloat3;
cout << aFloat2 << " " << anInt2 << " " << aFloat3;
```

24) The value printed for the variable `aFloat1` would be:

- 1) 0.0
- 2) 1.0
- 3) 4.2
- 4) 7.0
- 5) 17
- 6) 17.0
- 7) 72.0
- 8) 72.4
- 9) This would cause an error
- 10) none of the above

25) The value printed for the variable anInt1 would be:

- 1) -8
- 2) 1
- 3) 7
- 4) 12
- 5) 17
- 6) 72
- 7) 73
- 8) ' ' (a space)
- 9) This would cause an error
- 10) none of the above

26) The value printed for the variable aFloat2 would be:

- 1) -8.3
- 2) 0.0
- 3) 0.7
- 4) 4.2
- 5) 8.0
- 6) 8.3
- 7) 12.0
- 8) 81.62
- 9) This would cause an error
- 10) none of the above

27) The value printed for the variable anInt2 would be:

- 1) -3
- 2) 0
- 3) 2
- 4) 3
- 5) 9
- 6) 12
- 7) 14
- 8) 19
- 9) This would cause an error
- 10) none of the above

28) The value printed for the variable aFloat3 would be:

- 1) -3.0
- 2) 0.0
- 3) 0.2
- 4) 1.0
- 5) 9.0
- 6) 19.0
- 7) 19.2
- 8) 81.62
- 9) This would cause an error
- 10) none of the above

---

Assume the following variable declarations and initializations:

```
bool dog = true, cat = true, bunny = false;  
int a = 4, b = 1, c = 0;
```

Determine the value assigned by each of the following statements to the relevant Boolean variable, or if there's something (syntactically) wrong with the expression; choose from the following answers:

- 1 true                    2 false                    3 syntax error

29) cat = !bunny || !cat ;

30) dog = (a % (b + 3) <> 1);

31) bunny = ( (a + 2 \* b) / 3 && c);

32) dog = (b \* b - 4 \* a \* c > 0 && 2 \* a \* b > 0);

33) cat = (c / b == c \* a && a => b);

34) What is the value of the variable Q after the following code is executed?

```
int Q = 3, R = 5, S = 7, T = 9;
if (S + T % R >= Q + R) {
    --Q;
    if (T * 3 / S != R)
        --Q;
    else
        Q = Q - 3;
}
else {
    Q = T;
}
```

- 1) 0                      2) 1                      3) 2                      4) 3                      5) 9  
6) the code contains a syntax error                      7) none of the above
- 

35) What output will the following program produce?

```
#include <iostream.h>
void main( ) {
    int golfScore = 81, par = 83;
    if (golfScore < par)
        if (golfScore <= par - 5)
            cout << "Wow!";
    else
        cout << "Good job!";
}
```

- 1) Wow!                      2) Good job!                      3) "Wow!"                      4) "Good job!"  
5) both 1 and 2                      6) both 3 and 4                      7) No output is produced.
- 

36) What is the value printed for the variable gamma if the following code is executed?

```
int gamma= 0, x = 5;
if ( x % 2 == 1 )
    gamma = gamma + x;
x--;
if ( x / 2 == 0 )
    gamma = gamma + x;
x++;
if ( x % 2 == 1 )
    gamma = gamma + x;
cout << "gamma = " << gamma << endl;
```

- 1) 0                      2) 4                      3) 5                      4) 9                      5) 10  
6) 14                      7) 15                      8) None of the above

```
37)      int N1 = 3, N2 = 4;
         if (Q1 >= Q2)
             N1 = N1 + N2;
         else
             N2 = N1;
```

Which of the following code fragments is equivalent to the code above? "Equivalent" means that each code fragment would assign the same values to N1 and N2 as the code given above, no matter what the initial values for the variables Q1 and Q2 were.

- |   |   |
|---|---|
| 1) int N1 = 3, N2 = 4;<br>if (Q1 < Q2)<br>N2 = N1;<br>else<br>N1 = N1 + N2;           | 2) int N1 = 3, N2 = 4;<br>if (Q1 <= Q2)<br>N2 = N1;<br>else<br>N1 = N1 + N2           |
| 3) int N1 = 3, N2 = 4;<br>if (Q1 < Q2)<br>N2 = N1;<br>if (Q1 >= Q2 )<br>N1 = N1 + N2; | 4) int N1 = 3, N2 = 4;<br>if (Q1 >= Q2)<br>N1 = N1 + N2;<br>if (Q1 <= Q2)<br>N2 = N1; |
- 5) all of the above                      6) 1 and 2 only                      7) 1 and 3 only  
8) 2 and 4 only                          9) none are equivalent              10) none of the above

For the next 3 questions, consider execution of the following switch statement:

```
int id;
char middle = '#';
cout << "Enter id number ";
cin >> id;
switch (id) {
case 1: middle = 'A' ;
        break;
case 2: middle = 'B';
case 3: middle = 'C';
        break;
case 4: middle = 'D';
default: id = -1;
}
```

What would the value of middle be after execution of this code if the value read for id were:

| enter | 1   | 2   | 3   | 4   | 5   | 6                 |
|-------|-----|-----|-----|-----|-----|-------------------|
| 38) 2 | 'A' | 'B' | 'C' | 'D' | '#' | none of the above |
| 39) 4 | 'A' | 'B' | 'C' | 'D' | '#' | none of the above |
| 40) 5 | 'A' | 'B' | 'C' | 'D' | '#' | none of the above |