



READ THIS NOW!

Failure to read and follow the instructions below may result in severe penalties.

- 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 correctly on the Opscan form. Code **Form B** on the Opscan.
- Choose the single best answer for each question — some answers may be partially correct. If you mark more than one answer to a question, you will receive no credit for any of them.
- Unless a question involves determining whether given C++ code is syntactically correct, assume that it is. Unless a question specifically deals with compiler #include directives, you should assume the necessary header files have been included.
- Be careful to distinguish integer values from floating point values (containing a decimal point). In questions/answers that 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 (floating point)].
- **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 equal-valued multiple-choice questions.
- The answers you mark on the Opscan form will be considered your official answers.
- When you have finished, sign the pledge at the bottom of this page and turn in the test and your Opscan.

Do not start the test until instructed to do so!

Name (Last, First) _____ printed

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

_____ signature

For the next 2 questions, assume the input file stream `iFile` is connected to an input file whose contents are:

47 A321

(There's a single tab separating the '7' from the 'A'.) Consider execution of the following code fragment immediately after the file stream has been opened:

```
int i1;
char ch1 = 'x', ch2 = 'y', ch3 = 'z';
iFile >> ch1
      >> i1
      >> ch2
      >> ch3;
```

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

- | | | |
|-------|-------|------------------|
| 1) 4 | 4) 3 | 7) 321 |
| 2) 47 | 5) 32 | 8) none of these |
| 3) 7 | 6) 2 | |

2) The resulting value of the variable `ch3` would be:

- | | | |
|------------------|--------|------------------|
| 1) '4' | 4) 'A' | 7) '1' |
| 2) '7' | 5) '3' | 8) '\n' |
| 3) ' ' (a space) | 6) '2' | 9) none of these |

For the next 3 questions, assume the following variable declarations and initializations:

```
bool Burke;
int a = 5, b = 0, c = 3;
```

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

- 3) `Burke = 2 + b < c ;`
- 4) `Burke = (a + b < c || a + b == c);`
- 5) `Burke = (a != 0) || (a <= b) && (c < b);`

For the next 2 questions, select the value assigned to the relevant variable, given the declarations:

```
int    IntVar;
double DecVar;
```

	1	2	3	4	5
6) IntVar = 19.0 / 5;	3	3.0	3.8	4	none of these
7) DecVar = 5 / 2;	2	2.0	2.5	0.4	none of these

For the next 4 questions, suppose the (file) input stream In contains the following 5 lines of data (there's one tab character between columns and a newline character immediately after the last character on each line):

55	23	72	40	Gomer
17	30	95	28	Goober
6	34	82	66	Opie
19	62	36	21	Floyd
8	49	45	33	Bea

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;
string First = "Andy", Second = "Barney", Third = "Otis";
```

```
In >> Zero >> One >> Two >> Two;
In.ignore(100, '\n');
In >> Three >> Four >> Zero;
In.ignore(100, '\n');
In.ignore(100, '\n');
In.ignore(100, '\t');
In >> First;
In.ignore(100, '\n');
In >> Second;
```

	1	2	3	4	5
8) Zero	0	30	55	95	none of these
9) Four	4	23	30	34	none of these
10) First	"Andy"	"Goober"	"62"	"6"	none of these
11) Second	"Floyd"	" 8"	"8"	"\n"	none of these

For the following 3 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
12) 7 / 5 + 4 / 5	1	2	2.2	not allowed	none of these
13) 16 / 4 * 2 + 1	1	2	3	9	none of these
14) 1.0 + 7 / 2	4	4.0	4.5	not allowed	none of these

15) What is the second step in Polya's four-step process?

- | | |
|----------------------------|----------------------------|
| 1) Design a solution. | 4) Implement the solution. |
| 2) Understand the problem. | 5) Find an excuse. |
| 3) Test the solution. | 6) none of these |

For the next 4 questions, assume the input file stream In is connected to an input file whose contents are:

3.14 2.76 828 0.43 0 27

(There's a single space separating each adjacent pair of values.) Consider execution of the following code fragment immediately after the file stream has been opened:

```
int    anInt1;
float  aFloat1, aFloat2, aFloat3;
cout << fixed << showpoint;

In >> anInt1 >> aFloat1;
cout << anInt1 << endl;           // A
cout << setprecision(3) << aFloat1 << endl; // B

In >> aFloat2 >> aFloat3;
cout << setprecision(1) << aFloat2 << endl; // C
cout << setprecision(3) << aFloat3 << endl; // D
```

16) In the statement labeled A, the value printed for the variable anInt1 would be:

- | | | |
|------|-------|------------------|
| 1) 3 | 4) 14 | 7) 828 |
| 2) 1 | 5) 2 | 8) 314 |
| 3) 4 | 6) 76 | 9) none of these |

17) In the statement labeled B, the value printed for the variable aFloat1 would be:

- | | | |
|----------|----------|------------------|
| 1) 0.1 | 4) 2.76 | 7) 3.140 |
| 2) 0.14 | 5) 2.760 | 8) 0.100 |
| 3) 0.140 | 6) 3.14 | 9) none of these |

18) In the statement labeled C, the value printed for the variable aFloat2 would be:

- | | | |
|--------|---------|------------------|
| 1) 3.1 | 4) 2.8 | 7) 8.2 |
| 2) 3.2 | 5) 2.76 | 8) 8.3 |
| 3) 2.7 | 6) 14.0 | 9) none of these |

19) In the statement labeled D, the value printed for the variable aFloat3 would be:

- | | | |
|----------|------------|------------------|
| 1) 0.828 | 4) 828.00 | 7) 0.430 |
| 2) 8.280 | 5) 828.000 | 8) 2.760 |
| 3) 828.0 | 6) 0.43 | 9) none of these |

For the next 4 questions, consider writing a program that must read lines of data formatted in the following way. Each line will contain the name of a team, followed by a tab, followed by a score, followed by a tab, followed by another team name, followed by a tab, followed by another score, followed by a newline:

```
<team name><tab><score><tab><team name><tab><score><newline>
```

The team names are character strings and the scores are nonnegative integers. Assume that an input stream variable, `In`, has been opened on such a file, the current stream position is at the beginning of the file, and that the following variables have been declared:

```
string Team1, Team2;
int     Score1, Score2;
```

- 20) Which of the following statements will correctly read the first team name into the variable `Team1`?
- | | |
|---|------------------|
| 1) <code>In >> Team1;</code> | 5) 1 and 2 only |
| 2) <code>getline(In, Team1);</code> | 6) 1 and 3 only |
| 3) <code>getline(In, Team1, '\t');</code> | 7) 2 and 3 only |
| 4) 1, 2 and 3 | 8) none of these |
- 21) Assuming that the first team name, and the tab following it, have been read, which of the following statements will correctly read the first score into the variable `Score1`?
- | | |
|--|------------------|
| 1) <code>In >> Score1;</code> | 5) 1 and 2 only |
| 2) <code>getline(In, Score1);</code> | 6) 1 and 3 only |
| 3) <code>getline(In, Score1, '\t');</code> | 7) 2 and 3 only |
| 4) 1, 2 and 3 | 8) none of these |

For the next 2 questions suppose the input stream contains the following data:

```
Florida State<tab>61<tab>Virginia<tab>7<newline>
```

- 22) Which of the following would be true after the following statements were executed?
- ```
In >> Team1; // line 1
In >> Score1; // line 2
```
- |                                                        |                   |
|--------------------------------------------------------|-------------------|
| 1) <code>Team1 == "Florida State"</code>               | 6) 1 and 3 only   |
| 2) <code>Team1 == "Florida"</code>                     | 7) 2 and 3 only   |
| 3) <code>Score1 == 61</code>                           | 8) 1 and 4 only   |
| 4) An input failure occurred when line 1 was executed. | 9) 2 and 5 only   |
| 5) An input failure occurred when line 2 was executed. | 10) none of these |
- 23) Which of the following would be true after the following statements were executed, starting over at the beginning of the input stream?
- ```
getline(In, Team1, '\t'); // line 1
In >> Score1; // line 2
getline(In, Team2, '\t'); // line 3
```
- | | |
|--|-------------------|
| 1) <code>Team2 == "Virginia"</code> | 6) 1 and 3 only |
| 2) <code>Team2 == "\tVirginia"</code> | 7) 2 and 3 only |
| 3) An input failure occurred when line 1 was executed. | 8) 1 and 4 only |
| 4) An input failure occurred when line 2 was executed. | 9) 2 and 5 only |
| 5) An input failure occurred when line 3 was executed. | 10) none of these |

For the next 2 questions, consider execution of the following switch statement:

```
int Enter = 10;
cin >> Enter;

switch (Enter) {
case 1: Enter = -4;
        break;
case 2: Enter = -6;
case 4: break;
case 6: Enter = -8;
        break;
default: Enter = -1;
}
```

What would the value of `Enter` be after execution of this code if the given value were read for `Enter`?

		1	2	3	4	5	6
24)	4	-1	-4	-6	-8	10	none of these
25)	3	-1	-4	-6	-8	10	none of these

For the next 2 questions, assume the declarations:

```
string FName = "Foghorn", LName = "Leghorn";
int Age = 74;
```

- 26) What would be printed by the statement: `cout << FName + LName;`
- 1) Foghorn Leghorn
 - 2) Leghorn, Foghorn
 - 3) FoghornLeghorn
 - 4) The statement is not allowed.
 - 5) None of these
- 27) What would be printed by the statement: `cout << FName.length();`
- 1) Foghorn
 - 2) 7
 - 3) 8
 - 4) The statement is not allowed.
 - 5) None of these
- 28) Which of the following statements would print the name Leghorn, followed by the value of `Age`, so that the value of `Age` would be right-justified to column 20?
- 1) `cout << LName << setw(20) << Age;`
 - 2) `cout << LName << setw(20 - LName.length()) << Age;`
 - 3) `cout << LName << setw(20 + LName.length()) << Age;`
 - 4) `cout << LName << setw(LName.length() - 20) << Age;`
 - 5) All of these
 - 6) None of these

29) What output will the following program produce? (Be careful this may be tricky.)

```
#include <iostream>
using namespace std;

int main( ) {
    int Score = 87, Rank = 2;
    if (Score >= 95)
        if (Rank <= 5)
            cout << "Nice job!";
        else
            cout << "Good job!";
    return 0;
}
```

- | | | |
|----------------|-----------------|---------------------------|
| 1) Nice job! | 4) "Good job!" | 7) No output is produced. |
| 2) Good job! | 5) both 1 and 2 | 8) none of these |
| 3) "Nice job!" | 6) both 3 and 4 | |

30) What is the value of the variable Z after the following code is executed?

```
int W = 5, X = 9, Y = 5, Z = 1;
if (X + Y >= 2 * W) {
    Z++;
    if (Y - 3*W >= -X)
        Z--;
    else
        Z++;
}
else {
    Z = -1;
}
```

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

31) What is the value printed for the variable Delta if the following code is executed?

```
int Delta = 0, X = 4;

if ( X % 2 == 1 )
    Delta = Delta + X;
X++;

if ( X % 2 == 0 )
    Delta = Delta + X;
X++;

if ( X % 2 == 0 )
    Delta = Delta + X;

cout << "Delta = " << Delta << endl;
```

- | | | |
|------|------|------------------|
| 1) 0 | 4) 3 | 7) 6 |
| 2) 1 | 5) 4 | 8) None of these |
| 3) 2 | 6) 5 | |

For the next 2 questions, consider the loop below is intended to print the output: 2 4 6 8 10

```
int N;
for ( _____; N <= 10; _____ ) { // Line 1
    cout << N << ' ';
}
```

32) How should the first blank in Line 1 be filled?

- | | |
|----------|-----------------------------|
| 1) N = 0 | 4) It should be left blank. |
| 2) N > 0 | 5) It doesn't matter. |
| 3) N = 2 | 6) None of these |

33) How should the second blank in Line 1 be filled?

- | | |
|--------------|-----------------------------|
| 1) N++ | 4) It should be left blank. |
| 2) N = N + 2 | 5) It doesn't matter. |
| 3) N = 2 * N | 6) None of these |

For the next 2 questions, consider the following short program

```
#include <iostream>
using namespace std;

int main() {
    const int LIMIT = 10;
    int howMany;
    int Output = 5;

    while ( howMany < LIMIT ) {
        cout << Output << endl;
        howMany = howMany + 1;
    }
    return 0;
}
```

34) What is the loop control variable in the code above?

- | | | |
|------------|---------------------|------------------|
| 1) LIMIT | 4) while | 7) None of these |
| 2) howMany | 5) cout | |
| 3) Output | 6) There isn't one. | |

35) What is missing in the design of the loop?

- | | |
|--|------------------------------|
| 1) the initialization of the loop control variable | 4) the loop control variable |
| 2) the testing of the loop control variable | 5) Nothing is missing. |
| 3) the updating of the loop control variable | 6) None of these |

36) The loop below is intended to print the output: 3 6 9 12 15 18 21

```
int N = 0;
while ( _____ ) { // Line 1
    N = N + 3;
    cout << N << ' ';
}
```

How should the blank in Line 1 be filled in order to accomplish that?

- | | | |
|------------|------------------------|------------------|
| 1) N <= 21 | 4) Any of them will do | 7) 2 and 3 only |
| 2) N < 21 | 5) 1 and 2 only | 8) None of these |
| 3) N <= 18 | 6) 1 and 3 only | |

37) Which of the following represents the correct logic for a read-until-input-failure loop?

- 1) while (input succeeded) {
 // read next data item
 // process last data read
}
- 2) // read first data item
while (input succeeded) {
 // process last data read
}
- 3) while (input succeeded) {
 // process last data read
 // read next data item
}
- 4) // read first data item
while (input succeeded) {
 // process last data read
 // read next data item
}
- 5) 1 and 3 only
- 6) 2 and 4 only
- 7) None of these

For the next 3 questions, consider the following program and input file:

```
#include <iostream>
#include <fstream>
using namespace std;

int main() {
    const int stopValue = -1;
    int nextValue = 0;
    ifstream In("Data.txt");

    In >> nextValue;

    while ( nextValue != stopValue ) {
        cout << nextValue << ' ';
        In >> nextValue;
    }

    In.close();
    return 0;
}
```

Data.txt

3
10
7
25
-1
31
-1

38) What output would the program produce with the input file given above?

- 1) 3 10 7 25 -1
- 2) 3 10 7 25
- 3) 3 10 7 25 -1 31 -1
- 4) 3 10 7 25 -1 31
- 5) 3 10 7 25 -1 31 -1 -1 -1 . . . (forever)
- 6) None of these

39) What output would the program produce if the input file were changed to:

Data.txt

- 1) 3 10 7 25 -1
- 2) 3 10 7 25
- 3) 3 10 7 25 31
- 4) 3 10 7 25 31 -1 -1 -1 . . . (forever)
- 5) 3 10 7 25 31 31 31 31 . . . (forever)
- 6) None of these

3
10
7
25
31

40) What output would the program produce if the program were changed by deleting Line 5 and reversing the order of Line 7 and Line 8 and the first input file were used?

- 1) 3 10 7 25 -1
- 2) 3 10 7 25
- 3) 3 10 7 25 -1 31 -1
- 4) 3 10 7 25 -1 31
- 5) 3 10 7 25 -1 31 -1 -1 -1 . . . (forever)
- 6) None of these