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, followed by your 5 digit class number.
- 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.
- 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.
- 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 completed the test, 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 35 multiple-choice questions.
- Mark your answers on the test form, for future reference, and on the Opscan. The answers you mark on the Opscan form will be considered your official answers.

Do not start the test until instructed to do so!

Name ___________________________________   

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

_________________________________________________

signature
1) According to Polya’s 4-step process, what is the first thing to do?

1) Devise a plan 2) Write C code 3) Understand the problem
4) Test the plan 5) Have a Bud Light® 6) Call 411

2) Which of the following properties should an algorithm have?

1) finiteness 2) ambiguity 3) definition of sequence
4) all of the above 5) 1 & 2 only 6) 1 & 3 only
7) 2 & 3 only 8) none of the above

3) If your program compiles without error messages and executes without a runtime error message, but produces incorrect results you should look for:

1) syntax errors 2) axis of evil 3) undeclared identifiers
4) missing curly braces 5) logic errors 6) none of the above

4) Which of the following tasks are carried out by the compiler?

1) checking syntax 2) generating object code
3) checking design logic 4) all of the above 5) 1 & 2 only
6) 1 & 3 only 7) 2 & 3 only 8) none of the above

5) In the C++ language, the semicolon (;) is a statement ____________?

1) separator 2) generator 3) locator
4) terminator 5) none of the above

For the following 2 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.

6) $6.0 + 5 / 4$

1) 2.75 2) 7 3) 7.0 4) 7.25 5) None of these

7) $9 \% 10 + 3$

1) 3 2) 3.9 3) 4 4) 12 5) None of these
8) What value is assigned to `IntVar` by the declaration: `int IntVar = 11 + 5.8;`

1) 16  
2) 16.8  
3) 17  
4) 17.0  
5) None of these

For the next 4 questions, assume the variable declarations:

```cpp
#include <iostream>

using namespace std;

bool darth;
int jim, bones;
double scott, sulu;
```

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.)

9)  

```cpp
jim = 42;
scott = bones * jim;
```

10)  

```cpp
scott = 3.14159;
sulu = scott + jim;
```

11)  

```cpp
if ( darth )
    scott = sulu;
else
    bones = sulu;
```

12)  

```cpp
scott + jim = bones;
```

For the following 4 questions, assume the following variable declarations and initializations:

```cpp
bool spock, sherlock, hercule, marple=true;
int x=5, y=-1, z=3;
```

Determine the value assigned by each of the following C++ 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

13)  

```cpp
spock = x - 6 >= 2 * y;
```

14)  

```cpp
sherlock = (5y + 2z < 0);
```

15)  

```cpp
hercule = (x - z == y) || (x + 1 != y) && (y - 2 > x);
```

16)  

```cpp
marple = (y+6 != x || x+2 > y);
```
For the following 4 questions, suppose the (file) input stream infile contains the following data (there's one tab character between columns and a newline character immediately after the last character on each line):

```
12 13 42  New Zealand
7  20 69  Frank Zappa
9  28 41  TW400
11 19 63  Gettysburg Address
```

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

```cpp
int uno = 1, dos = 2, tres = 3, quattro = 4;
infile >> uno >> dos;
infile.ignore(100, '\n');
infile >> tres >> quattro;
infile.ignore(100, '\n');
infile >> dos >> tres >> tres;
infile.ignore(100, '\n');
```

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>uno</td>
<td>12 13 57 42</td>
</tr>
<tr>
<td>dos</td>
<td>7 28 11 13</td>
</tr>
<tr>
<td>tres</td>
<td>20 28 19 41</td>
</tr>
<tr>
<td>quattro</td>
<td>11 10 20 28</td>
</tr>
</tbody>
</table>

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

```
43 2b 19
```

(There's a single tab separating the '3' from the '2' and another single tab separating the 'b' from the '1'.) Consider execution of the following code fragment immediately after the file stream has been opened:

```cpp
int i1 = 17;
char ch1 = 'a', ch2 = 'b', ch3 = 'c';
iFile >> ch1;
iFile >> i1;
iFile.get(ch2);
```

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

1) '4'
2) '3'
3) '2'
4) 'b'
5) ' ' (a space)
6) '1'
7) '\'t'
8) None of these

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

1) '2'
2) 'b'
3) ' ' (a space)
4) '1'
5) '9'
6) '\'t'
7) None of these
23) For this question, suppose the input file, infile.data contains the following data:

4 1 4 9 7 1 4 8 -5 3 6 7

Consider executing the following program code fragment:

```cpp
void main() {
    int alpha, beta, gamma, delta, sum = 0;
    ifstream infile;
    infile.open("infile.data");
    infile >> alpha >> beta >> gamma >> delta;
    while (infile) {
        sum = sum + alpha + beta + gamma + delta;
        cout << sum << endl;
        infile >> alpha >> beta >> gamma >> delta;
    }
    infile.close( );
}
```

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

1) 11 2) 18 3) 20 4) 38 5) 49 6) None of these

24) What is the value of the variable D after the following code is executed?

```cpp
int A = 3, B = 4, C = 7, D = 2;
if (2*A >= B + 1) {
    D = 3;
    if (C < B + 2*D)
        D = 2;
    else
        D = 1;
} else {
    D = 0;
}
```

1) 0 2) 1 3) 2 4) 3 5) 18 6) The code contains a syntax error 7) None of these
For the next 4 questions, assume the input file stream `fred` is connected to an input file whose contents are:

```
53 -21 17.9 19 22 61
2.4 1.8 -12 3 7 15 18
3.14 2.71828 43 0 27
```

(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:

```cpp
int anInt1, anInt2, anInt3;
float aFloat1, aFloat2;
fred >> anInt1 >> anInt2 >> aFloat1 >> anInt3;
cout << anInt1 << anInt2 << aFloat1 << anInt3; // line 1
fred.ignore(80, '\n');
fred >> anInt3 >> aFloat2;
fred.ignore( 6, '\n');
fred >> anInt2;
cout << anInt3 << aFloat2 << anInt2; // line 2
```

25) The value printed for the variable `anInt1` in line 1 would be:

1) 2  
2) 53  
3) -21  
4) 17  
5) 9  
6) 19  
7) 32  
8) 91  
9) This would cause an error  
10) None of these

26) The value printed for the variable `anInt3` in line 1 would be:

1) 2  
2) 53  
3) -21  
4) 17  
5) 9  
6) 19  
7) 32  
8) 91  
9) This would cause an error  
10) None of these

27) The value printed for the variable `aFloat2` in line 2 would be:

1) 0.4  
2) 1.8  
3) 2.0  
4) 2.4  
5) 3.14  
6) 19.0  
7) 32.0  
8) 91.0  
9) This would cause an error  
10) None of these

28) The second value printed for the variable `anInt2` in line 2 would be:

1) -12  
2) 2  
3) 3  
4) 5  
5) 7  
6) 8  
7) 12  
8) 15  
9) This would cause an error  
10) None of these
29) What output will the following code fragment produce?

```c++
void main( ) {
    int score = 87, rank = 2;
    if (score >= 95)
        if (rank <= 5)
            cout << "Nice job!";
        else
            cout << "Good job!";
    
    1) Nice job!  2) Good job!  3) "Nice job!"  4) "Good job!"
    5) both 1 and 2  6) both 3 and 4  7) No output is produced
}
```

30) What is the value printed for the variable alpha if the following code is executed?

```c++
int alpha = 0, K = 6;
if (K % 2 == 0)
    alpha = alpha + K;
K++;
if (K % 2 == 0)
    alpha = alpha + K;
K++;
if (K % 2 == 0)
    alpha = alpha + K;
cout << "alpha = " << alpha << endl;
```

1) 0  2) 3  3) 4  4) 6  5) 8  6) 12  7) 14  8) None of these

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

```c++
int Passed = 14;
cin >> Passed;
switch (Passed) {
    case 0: Passed = 3;
            break;
    case 1:
    case 3: Passed = 6;
    case 5: Passed = 10;
            break;
    default: Passed = 0;
}
```

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

<table>
<thead>
<tr>
<th>Passed</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
<th>4)</th>
<th>5)</th>
<th>6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31) 1</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>14</td>
<td>None of these</td>
</tr>
<tr>
<td>32) 4</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>14</td>
<td>None of these</td>
</tr>
</tbody>
</table>
The incomplete code below is intended to process an input stream containing an integer value, followed by an arithmetic operator symbol that must be a plus sign or a minus sign, and then another integer value. The two integer values are then to be combined, as indicated by the given arithmetic operator symbol, and the resulting value is to be printed. For example, if the input stream contains \texttt{58 - 17} the code should print the value \texttt{41}.

```cpp
int Operand1, Operand2;
char Operator;
iFile >> Operand1 >> Operator >> Operand2;
if (Operator == '+') // line 1
    cout << Operand1 + Operand2; // line 2
else // line 3
    cout << Operand1 - Operand2;
else
    cout << "Bad operator symbol.";
```

33) In order for this code to perform as described above, the blank in line 1 should be filled with:
   1) ==  
   2) =  
   3) !  
   4) <<  
   5) None of these

34) In order for this code to perform as described above, the blank in line 2 should be filled with:
   1) Operand1 << Operator << Operand2  
   2) Operand1 + Operand2  
   3) Operand1 - Operand2  
   4) Operand1 << '+' << Operand2  
   5) None of these

35) In order for this code to perform as described above, the blank in line 3 should be filled with:
   1) Nothing at all  
   2) (Operator == '-')  
   3) if (Operator == '-')  
   4) if (Operator == '-')  
   5) None of these