



**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 correctly on the OpSCAN form. Code **Form C** on the OpSCAN; code your section **group** number:

<u>Instructor</u>	<u>Section</u>	<u>Group</u>
Struble	Nor 136 8:00am MWF	1
Struble	Han 100 11:15am MWF	2
Barnette	Nor 136 8:00am TuTh	3
Tucker	Torg 2150 2:00TuTh	4

- 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 (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 30 equal-valued 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!**

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 consider the following code:

```
void main ()
{
    int Value1 = 1;
    int Value2 = 3;

    Mystery (Value1, Value2);
    cout << Value1<< ' ' << Value2 << endl;
}

void Mystery (int Param1, int& Param2)
{
    Param1 = Param1 * 5;
    Param2 = Param2 * 2;
}
```

1) What is printed out for Value1?

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

2) What is printed out for Value2?

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

---

3) Given the function heading

```
int FindIt( int& howMany,
           float& alpha,
           float beta )
```

which of the following is a valid function prototype for FindIt?

- 1) int FindIt( int& howMany, float& alpha, float beta );  
2) void FindIt( int&, float&, float );  
3) int FindIt( int, float&, float& );  
4) 1 and 2 above  
5) 1, 2, and 3 above
-

For the next 2 questions consider the execution of the following program:  
(Hint – trace the program carefully.)

```
void main()
{
int LoopCounter, Count=0;
for (LoopCounter = 0; LoopCounter < 10; LoopCounter++)
{
    LoopCounter++;
    Count++;
}
cout << LoopCounter;
cout << Count;
}
```

4) What value is printed for the variable LoopCounter:

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

5) What value is printed for the variable Count:

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

Consider executing the following program:

```
void main ()
{
    int i, j, count=0, Answer;
    Answer = 1;
    for (i = 1; i < 3; i=i+1) {
        for (j = 1; j < 5; j=j+2){
            count++;
            Answer = Answer * i * j;
        }
    }
    cout << Answer << endl << count << endl;
}
```

6) What value is printed for the variable Answer:

- 1) 0                      2) 1                      3) 2                      4) 15                      5) 18                      6) 36  
7) 72                      8) none of the above

7) What value is printed for the variable count :

- 1) 0                      2) 1                      3) 2                      4) 15                      5) 18                      6) 36  
7) 72                      8) none of the above
-

```
void main()
{
    int Count = 0;
    int number = 2;
    bool done = false;
    while (!done)
    {
        Count++;
        number = number * 2;
        done = (number > 64);
    }
    cout << Count << endl;
}
```

8) What is printed out when the above code is executed?

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

```
void main()
{
    int i=1, sum, j;
    while (i <= 5)
    {
        sum = 0;
        j = 1;
        while (j<=i)
        {
            sum = sum + j;
            j++;
        }
        i++;
    }
    cout << sum << endl;
}
```

9) What is printed out for sum when the above code is executed?

- 1) 0                    2) 1                    3) 5                    4) 14                   5) 15  
6) none of the above
- 

```
void main() {
    int i, j, A[2][4] = {1,2,3,4,5,6,7,8};
    for (i = 0; i < 4; i++)
        for (j = 0; j < 2; j++)
            cout << A[j][i] << endl;
}
```

10) What is the value printed on the fifth line of output?

- 1) 1                    2) 2                    3) 3                    4) 4                    5) 5                    6) 6  
7) 7                    8) 8                    9) none of the above

11) Consider the function definition

```
void DoThis( int& alpha,  
            int  beta  )  
{  
    int temp;  
  
    alpha = alpha + 100;  
    temp = beta;  
    beta = 999;  
}
```

Suppose that the caller has integer variables `gamma` and `delta` whose values are 10 and 20, respectively. What are the values of `gamma` and `delta` after return from the following function call?

```
DoThis(gamma,delta);
```

- 1) `gamma = 10` and `delta = 20`
- 2) `gamma = 110` and `delta = 20`
- 3) `gamma = 10` and `delta = 999`
- 4) `gamma = 110` and `delta = 999`
- 5) none of the above

---

12) What is the output of the following code fragment? (All variables are of type `int`.)

```
int alpha, beta;  
alpha = 3;  
beta = 20;  
if (beta > 10)  
{  
    int alpha = 5;  
  
    beta = beta + alpha;  
    cout << alpha << ' ' << beta << endl;  
}  
cout << alpha << ' ' << beta << endl;
```

- 1) 3 20
- 2) 3 25  
   3 25
- 3) 5 25  
   5 25
- 4) 5 25  
   3 25
- 5) 5 25  
   3 20

---

13) What is the output of the following code fragment if the input value is 4? (Be careful here.)

```
int num;  
int alpha = 10;  
  
cin >> num;  
switch (num)  
{  
    case 3 : alpha++;  
    case 4 : alpha = alpha + 2;  
    case 8 : alpha = alpha + 3;  
    default : alpha = alpha + 4;  
}  
cout << alpha << endl;
```

- 1) 10
  - 2) 14
  - 3) 12
  - 4) 19
  - 5) 15
-

14) What is the output of the following code fragment? (beta is of type int.)

```
beta = 5;
do
{
    switch (beta)
    {
        case 1 : cout << 'R';
                break;
        case 2 :
        case 4 : cout << 'O';
                break;
        case 5 : cout << 'L';
    }
    beta--;
} while (beta > 1);
cout << 'X' << endl;
```

- 1) X    2) ROOLX    3) LOOX    4) LOORX    5) ROOX
- 

15) Which of the loops below produces the same number of loop iterations as the following loop?  
(count is of type int)

```
for (count = 1; count <= 10; count++)
    DoSomething();
```

- 1) for (count = 10; count >= 1; count--)  
 DoSomething();  
2) for (count = 0; count < 10; count++)  
 DoSomething();  
3) for (count = 10; count >= 0; count--)  
 DoSomething();  
4) 1 and 2 above  
5) 1, 2, and 3 above
- 

16) What is the content of the array `arr` after the for loop?

```
int arr[5];
int j = 0;

for (i = 0; i < 5; i++)
{
    arr[i] = i+j;
    j = j + 1;
}
```

- 1) 0 1 2 3 4                    3) 0 2 4 6 8  
2) 1 2 3 4 5                    4) 1 3 5 7 9
-

For the next 5 questions, consider the incomplete function definition given below:

```
// CountAs takes an array of characters and count the number of times
// the character 'A' appears in the list.
//
// Parameters:
//   CharacterList[]   array containing characters.
//   NumOfCharacters   number of characters to check
//   TotalA            number of As in the array

void CountAs( char _____, int NumOfCharacters, int& TotalA)// Line A
{
    int LoopCounter;

    for(LoopCounter=0;_____;LoopCounter++)           //Line B
    {
        if ( _____ == 'A') //Line C
            TotalA=TotalA+_____;           //Line D
    }

    cout<<"The number of 'A's is = "<<_____; //Line E
}
```

17) How should the blank for the first parameter in line A be filled?

- 1) CharacterList
- 2) CharacterList[]
- 3) 'A'
- 4) it should be left blank
- 5) none of these

18) How should the blank in line B be filled?

- 1) LoopCounter < 100
- 2) LoopCounter <= NumOfCharacters
- 3) LoopCounter <= 100
- 4) LoopCounter < NumOfCharacters
- 5) none of these

19) How should the blank in line C be filled?

- 1) CharacterList[NumOfCharacters]
- 2) CharacterList[LoopCounter]
- 3) LoopCounter
- 4) none of these
- 5) NumOfCharacters

20) How should the blank in line D be filled?

- 1) 1
- 2) CharacterList
- 3) LoopCounter
- 4) none of these
- 5) NumOfCharacters

21) How should the blank in line E be filled?

- 1) TotalA
  - 2) CharacterList[LoopCounter]
  - 3) LoopCount
  - 4) none of these
  - 5) NumOfCharacters
-

Consider the following code:

```
void silly (int);
int main()
{
    int x,y;

    // do something silly
    x=10;
    y=11;
    silly(x);
    silly(y); // values here

    return 0;
}

void silly (int x)
{ int y;
  y = x + 2;
  x = x * 2;
} // end silly
```

22) What are the values of main function variables x and y at the point marked // values here?

- |                  |                  |
|------------------|------------------|
| 1) x=10 and y=11 | 2) x=20 and y=22 |
| 3) x=11 and y=10 | 4) x=40 and y=11 |
| 5) x=20 and y=12 | 6) x=40 and y=14 |

23) What are the values of the main function's variables x and y if x was passed by reference to the silly function at the point marked // values here?

- |                  |                  |
|------------------|------------------|
| 1) x=10 and y=11 | 2) x=20 and y=22 |
| 3) x=11 and y=10 | 4) x=40 and y=11 |
| 5) x=20 and y=12 | 6) x=40 and y=14 |

---

For the next 3 questions consider the following code:

```
for (int i=1; i<10; i++)
{
    for (int j=0; j<=i; j++)
        cout << setw (4) << (i + j); //first
    cout << endl; //second
}
```

24) How many times does the first cout statement execute?

- |        |                         |
|--------|-------------------------|
| 1) 100 | 2) 56                   |
| 3) 10  | 4) 55                   |
| 5) 11  | 6) cannot be determined |

25) How many times does the second cout statement execute?

- |        |                         |
|--------|-------------------------|
| 1) 100 | 2) 56                   |
| 3) 10  | 4) 55                   |
| 5) 11  | 6) cannot be determined |

26) What is the last value displayed?

- |       |                      |
|-------|----------------------|
| 1) 10 | 2) 19                |
| 3) 11 | 4) 20                |
| 5) 18 | 6) none of the above |

---

Consider the following code:

```
int main()
{
    int x[8];           // line 1
    for (int i=0;i<9;i++) // line 2
        x[i] = i;      // line 3
    return 0;          // line 4
}
```

27) Which line of code should be changed to prevent a possible runtime error in the program?

- 1) 1                                      2) 2                                      3) 3                                      4) 4  
5) either 1 or 2                        6) either 1 or 3                        7) either 2 or 3                        8) either 1 or 4

---

```
num = 345;
do
{
    cout << ' ' << num % 10;
    num = num /10;
} while (num > 0);
```

28) What does the above code segment display?

- 1) 5 .5 0                                      2) 3 4 5  
3) .5 0 0                                      4) 5 4 3  
5) 34.5 3.45 .345                            6) none of the above

---

```
int X; // 1
void main() {
    int Y; // 2
    while(Y < 10) {
        int X = 0; // 3
        X++;
        Y = Y + X;
    }
    cout << X << endl;
}
```

29) Choose the correct statement about the above code:

- 1) The lifetime of the variable X in declaration 1 is the entire execution of the program.  
2) The variable X in declaration 3 is initialized to 0 during each iteration of the while loop.  
3) The scope of the variable X in declaration 1 is the entire body of main() except for the while loop.  
4) The variable Y in declaration 2 should be initialized; otherwise, the content of Y is unpredictable.  
5) All of the above.  
6) None of the above.

---

30) Choose the correct statement about **parameter passing by value**:

- 1) Actual and formal parameters must be of similar types.  
2) Formal parameters must be declared as local variables in the function body.  
3) Actual parameters in a function call cannot be constants or expressions; they must be variables.  
4) Parameter passing by value can be used both for input and output communication purposes.  
5) All of the above are correct.  
6) None of the above is correct.