Instructions: Submit your answers to these questions to the Curator as OQ1 by the posted due date and time. No late submissions will be accepted.

For questions 1 through 4, consider executing the code fragment:

```c
bool A, B, C, D;
// code that assigns values to A, B, C, and D occurs here
if (A && B)
    if (!C || !D)
        printf("one");
    else if (D)
        printf("two");
else
    printf("three");
else if (C != D)
    printf("four");
else if (C)
    printf("five");
else
    printf("six");
```

1. What of the following sets of values for A, B, C, and D would cause the string "three" to be printed?

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>true</td>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>2</td>
<td>true</td>
<td>true</td>
<td>true</td>
<td>false</td>
</tr>
<tr>
<td>3</td>
<td>true</td>
<td>true</td>
<td>false</td>
<td>true</td>
</tr>
<tr>
<td>4</td>
<td>true</td>
<td>true</td>
<td>false</td>
<td>false</td>
</tr>
<tr>
<td>5</td>
<td>All of the above</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1 and 2 only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1, 2 and 3 only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2 and 3 only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>2, 3 and 4 only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>None of these</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. What of the following sets of values for A, B, C, and D would cause the string "four" to be printed?

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>false</td>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>2</td>
<td>true</td>
<td>false</td>
<td>false</td>
<td>true</td>
</tr>
<tr>
<td>3</td>
<td>false</td>
<td>false</td>
<td>true</td>
<td>false</td>
</tr>
<tr>
<td>4</td>
<td>false</td>
<td>false</td>
<td>false</td>
<td>false</td>
</tr>
<tr>
<td>5</td>
<td>All of the above</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1 and 2 only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1, 2 and 3 only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2 and 3 only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1, 3 and 4 only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>None of these</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. No matter what values A, B, C, and D have, the given code fragment will produce some output.

<p>| | |</p>
<table>
<thead>
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</tr>
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<tbody>
<tr>
<td>1</td>
<td>True</td>
</tr>
<tr>
<td>2</td>
<td>False</td>
</tr>
<tr>
<td>3</td>
<td>None of these</td>
</tr>
</tbody>
</table>
4. What of the following sets of values for A, B, C, and D would cause the string "six" to be printed?

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>2)</td>
<td>true</td>
<td>false</td>
<td>true</td>
</tr>
<tr>
<td>3)</td>
<td>false</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>4)</td>
<td>false</td>
<td>false</td>
<td>false</td>
</tr>
<tr>
<td>5)</td>
<td>All of the above</td>
<td>8)</td>
<td>2 and 3 only</td>
</tr>
<tr>
<td>6)</td>
<td>1 and 2 only</td>
<td>9)</td>
<td>1, 3 and 4 only</td>
</tr>
<tr>
<td>7)</td>
<td>1, 2 and 3 only</td>
<td>10)</td>
<td>None of these</td>
</tr>
</tbody>
</table>

5. Consider executing the following code fragment (assume \(x\) is an int variable):

```c
if ( x < 0 )
    printf("one");
else if ( x <= 10 )
    printf("two");
else if ( x <= 20 )
    printf("three");
```

The string "two" will be printed if and only if \(x\) satisfies the condition:

1) \(0 \leq x\)  
2) \(x \leq 10\)  
3) \(0 < x \) and \(x < 10\)  
4) \(0 < x \) and \(x \leq 10\)  
5) \(0 \leq x \) and \(x < 10\)  
6) \(0 \leq x \) and \(x \leq 10\)  
7) None of these

6. What is the logical condition under which the following while loop will terminate?

```c
int Beta = 5;
while (Beta >= 0 && Beta < 10) {
    printf("%d\n", Beta);
    scanf("%d", &Beta);
}
```

1) \(Beta < 0 \) and \(Beta >= 10\)  
2) \(Beta < 0 \) and \(Beta > 10\)  
3) \(Beta < 0 \) and \(Beta < 10\)  
4) \(Beta <= 0 \) or \(Beta >= 10\)  
5) None of these

7. What value is printed for loopCount if the following code fragment is executed?

```c
int loopCount = 0, alpha = 5;
while (loopCount <= 145) {
    alpha = alpha + 7;
    loopCount++;
}
printf("loopCount = %d\n", loopCount);
```

1) 1  
2) 144  
3) 145  
4) 146  
5) 147  
6) None of these
8. What is the output of the following code fragment?

```c
int n = 1;
while (n <= 5) {
    printf("%2d", n);
    n++;
}
```

1) 1 2 3 4 5  
2) 1 2 3 4  
3) 1 1 1 forever  
4) 2 3 4 5  
5) 2 3 4 5 6  
6) None of these

9. What is the output of the following code fragment?

```c
int n = 1;
while (n <= 5) {
    n++;
    printf("%2d", n);
}
```

1) 1 2 3 4 5  
2) 1 2 3 4  
3) 1 1 1 forever  
4) 2 3 4 5  
5) 2 3 4 5 6  
6) None of these

10. To produce the output 2 4 6 8 10, what loop condition should be used in the blank below?

```c
int N = 0;
do {
    N = N + 2;
    printf("%2d", N);
} while (__________);
```

1) N <= 10  
2) N < 10  
3) N < 8  
4) N >= 2  
5) N > 8  
6) None of these