Assignment 6

The due date for submitting this assignment has passed.
As our records show you have not submitted this assignment.

Consider the given data for the production planning problem discussed in the course.

<table>
<thead>
<tr>
<th>Product</th>
<th>Profit</th>
<th>Production capacity (units per week)</th>
<th>Production cost (units per week)</th>
<th>Investment cost (units per week)</th>
<th>Non-overlapping constraint (number of units)</th>
<th>Cost function (per unit of product)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>10</td>
<td>$15</td>
</tr>
<tr>
<td>B</td>
<td>6</td>
<td>12</td>
<td>8</td>
<td>3</td>
<td>20</td>
<td>$20</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>30</td>
<td>$30</td>
</tr>
</tbody>
</table>

The production capacity of each product is limited by the following constraints:

A: \( x_A \leq 10 \)  
B: \( x_B \leq 12 \)  
C: \( x_C \leq 14 \)

The production cost of each product is given by:

A: \( C_A = 5x_A \)  
B: \( C_B = 8x_B \)  
C: \( C_C = 10x_C \)

The investment cost of each product is given by:

A: \( I_A = 2x_A \)  
B: \( I_B = 3x_B \)  
C: \( I_C = 4x_C \)

The non-overlapping constraint states that the production of each product cannot overlap with the production of the other products.

1. For the production plan, \( x_A = 6 \) and \( x_B = 2 \), the total amount of product 12 produced is _______ (round off to two decimal places)

2. The total profit for the production plan, \( x_A = 10 \) and \( x_B = 8 \), is _______ (round off to two decimal places)

3. For the production plan, \( x_A = 10 \) and \( x_B = 8 \), which of the following statements is correct? Assume that the non-overlapping constraint is not to be employed.
   - Plan A is a feasible solution.
   - Plan B is a feasible solution.
   - Plan C is a feasible solution.
   - Plan D is a feasible solution.

4. For the production plan, \( x_A = 10 \) and \( x_B = 8 \), if the total amount of raw material used is 30 units, the penalty incurred due to violation of the constraint for raw material is _______ (round off to two decimal places)

5. For the production plan, \( x_A = 10 \) and \( x_B = 8 \), if the total amount of investment cost incurred is 50 units, the penalty incurred due to violation of the constraint for investment cost is _______ (round off to two decimal places)

6. For the production plan, \( x_A = 10 \) and \( x_B = 8 \), the total revenue earned is _______ (round off to two decimal places)

7. For the production plan, \( x_A = 10 \) and \( x_B = 8 \), the total profit is _______ (round off to two decimal places)

8. For the production plan, \( x_A = 10 \) and \( x_B = 8 \), the total profit is _______ (round off to two decimal places)

9. For the production plan, \( x_A = 10 \) and \( x_B = 8 \), the total profit is _______ (round off to two decimal places)

10. For the production plan, \( x_A = 10 \) and \( x_B = 8 \), the total profit is _______ (round off to two decimal places)