Question One (5-Points)
Write True if the statement is true or False if not:

1. An event \( E \) and its complement are mutually exclusive events: **True**
2. If \( E_1 \) and \( E_2 \) are independent and \( E_1 \) occurs then \( E_2 \) will occur: **False**
3. The conditional probability of two mutually exclusive events always positive value: **False**
4. The interval \([-2, 5]\) can not be sample space because it contains negative values: **False**
5. The infinite set \( \{1, 2, 3, \ldots\} \) is possible values for a continues random variable: **False**

Question Two (5-Points)
1. If the sample space consist of five elementary events such that:
   
   \[
   P(e_1) = P(e_2) = 0.15, P(e_3) = 0.10, P(e_4) = 2P(e_5), \text{ and } A = \{e_1, e_3, e_4\}
   
   B = \{e_3, e_4\} \text{ are tow events defined on the sample space, then } P(A \text{ or } B) =
   
   a. 0.90  
   b. 0.05 
   c. 0.80
   d. None

2. Refer back to the above sample space in part (1), then \( P(A \text{ and } B) =

   a. 0.90  
   b. 0.10 
   c. 0.40
   d. **0.60**

3. If \( X \) is a random variable having the following probability distribution, then \( \mu_x =

   \[
   \begin{array}{c|ccccc}
   X & -1 & 0 & 2 & 3 & 5 \\
   P(x) & 0.2 & 0.15 & .05 & 0.25 & b \\
   \end{array}
   
   a. -1.76  
   b. **2.4** 
   c. 0.35
   d. None

4. Refer back to part (3), then \( \sigma_x^2 \) is equal to:

   a. 4.96  
   b. **5.64** 
   c. 11.4 
   d. None

5. If \( X \) and \( Y \) two random variables, and \( E(X) = -4 \), \( E(Y) = -5 \), then \( E(X - Y) =

   a. -9  
   b. **9** 
   c. **1** 
   d. -1