Question One (5-Points)
Write True if the statement is true or False if not:
1. Two events are considered to be mutually exclusive if the events are also independent. False
2. If $E_1$ and $E_2$ are independent and $E_1$ occurs then $E_2$ can’t occur: False
3. The conditional probability of two mutually exclusive events always positive value: False
4. The interval $[-5,-1]$ can not be an event from any sample space because it is negative: False
5. The infinite set $\{1,2,3,4,...\}$ can not be a possible values for a discrete random variable: False

Question Two (5-Points)
1. If the sample space consist of five elementary events such that:
   \[ P(e_1) = P(e_2) = 0.15, P(e_3) = 0.40, P(e_4) = 2P(e_5), \text{ and } A = \{e_1,e_3,e_4\} \]
   \[ B = \{e_2,e_3\} \] are two events defined on the sample space, then $P(A \text{ or } B) =$
   a. 0.90  b. 0.05  c. 0.40  d. None
2. Refer back to the above sample space in part (1), then $P(A \text{ and } B) =$
   a. 0.40  b. 0.10  c. 0.60  d. 0
3. If $X$ is a random variable having the following Probability distribution, then $\mu_x =$
   \[ X \quad -1 \quad 0 \quad 2 \quad 3 \quad 5 \]
   \[ P(x) \quad 0.2 \quad 0.15 \quad .05 \quad a \quad 0.25 \]
   a. -1.76  b. 2.2  c. 0.35  d. None
4. Refer back to part (3), then $\sigma_x^2$ is equal to:
   a. 4.96  b. 2.04  c. 9.8  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