Performance Evaluation of Computer systems

Homework 1

Deadline: 12 esfand 1400

Use LaTeX to write your homework

1. Let A and B be two events such that $P(A) = 0.3, P(B) = 0.1,\ P(A \cup B) = 0.4$. find P(A|B).

2. Let A and B be two events. Let us consider $P(A) = 0.2, P(B) = 0.5$, and $P((A \cup B)^c) = 0.35$. Are A and B independent?

3. The probability of simultaneous occurrence of at least one of two events A and B is p. If the probability that exactly one of A, B occurs is q, then prove that

$$P\,(A') \;+\; P\,(B') \;=\; 2 - 2p \;+\; q$$

4. Suppose A and B are two independent events. If probability that event A occurs is 0.8 and the probability that exactly one of them occur is 0.5, find the probability of event B.

5. Machines A, B and C produce 40%, 30% and 30%, respectively, of the production of a component intended for the motor industry. It is known that 4% of the components produced by one each of machines A and B are defective while 5% of the components produced by machine C is defective. If a component is selected at random from a day's production, (a) calculate the probability that it is defective, (b) calculate the probability that the defective component was produced on machine A.

6. To inspect one hundred items, four randomly selected items are tested. All items are rejected if a minimum of one of the four is defected. If there are a total of 5 defectives, then what is the probability that the batch is accepted?