

Probability Assignment (4) Mathematics

Recall ①  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

②  $P(A \cap B') = P(A) - P(A \cap B)$

③  $P(A' \cap B) = P(B) - P(A \cap B)$

④  $P(A' \cap B') = P(A \cup B)' = 1 - P(A \cup B)$

⑤ If  $P(A' \cup B') = P(A \cap B)'$  then  $P(A \cap B) = 0$ .

⑥  $P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(B \cap C) - P(A \cap C) + P(A \cap B \cap C)$

I If A & B are two events associated with a random experiment for which

(i)  $P(A) = 0.60$ ,  $P(A \cup B) = 0.85$ ,  $P(A \cap B) = 0.42$  Find  $P(B)$

(ii)  $P(A) = 0.4$ ;  $P(B) = 0.5$ ,  $P(A \cup B) = 0.6$  Find  $P(A \cap B)$

(iii)  $P(A \cup B) = 0.7$ ;  $P(A \cap B) = 0.3$ ;  $P(A') = 0.4$  Find  $P(B)$

(iv)  $P(A) = 0.25$ ;  $P(B) = 0.4$ ;  $P(A \cup B) = 0.5$  Find  $P(A \cap B)$ ,  $P(A \cap B')$ ;  $P(A' \cap B)$

(v)  $P(A) = 0.3$ ;  $P(B) = 0.2$ ;  $P(A \cap B) = 0.1$  find  $P(A' \cap B)$ ;  $P(A \cap B')$

(vi) Let A and B be two mutually exclusive events of a random experiment s.t.  $P(\text{not } A) = 0.65$   $P(A \cup B) = 0.65$ , Find  $P(B)$ .

(vii) Given  $P(A) = 0.5$ ;  $P(B) = 0.2$  &  $P(A \cup B) = 0.1$  Find  $P(A \cap B)$ ;  $P(A' \cap B)$ ;  $P(A' \cup B')$ ;  $P(A' \cap B')$

(viii) If A and B are two events then  $P(A) = 1/4$ ;  $P(B) = 2/5$ ;  $P(A \cup B) = 1/2$  Find the values of  $P(A \cap B)$ ;  $P(A \cap B')$ .

11) Find the probability that when a hand of 7 cards is drawn from a well shuffled pack of 52 cards, if it contains (i) all kings (ii) exactly 3 kings (iii) at least 3 kings  
(Ans:  $\frac{1}{7735}$  ;  $\frac{9}{1547}$  ;  $\frac{46}{7735}$ )

2) There are 4 letters and 4 addressed envelopes. Find the probability that all the letters are not dispatched in right envelopes. Ans ( $\frac{23}{24}$ )

3) A hockey match is played from 3pm to 5pm. A man arrives late for match. What is the probability that he misses the only goal of the match which is scored at the 20th minute of the match? ( $\frac{5}{6}$ )

4) A team of medical students during their internship have to assist during surgeries at a city hospital. The probabilities of surgeries rated as very complex, complex, routine, simple or very simple are respectively: 0.15, 0.20, 0.31, 0.26, 0.08. Find the probabilities that a particular surgery will be rated a) complex or very complex, b) neither very complex nor very simple c) routine or complex, d) routine or simple. [0.15, 0.77, 0.51, 0.57]

5) A bag contains 8 white, 4 red, 6 blue balls. Two balls are drawn from the bag. Find the probability of getting (i) one white and one red. (ii) At least one red. (iii) At most 2 red. (iv) Not red. (v) Not blue.

6) Six new employees, two of whom are married to each other, are to be assigned six desks that are lined up in a row. If the assignment of employees to desks is made randomly, what is the probability that the married couple will have non-adjacent desks? ( $\frac{2}{3}$ )