Assignment 1

S Nithish

***Abstract*—This document contains the questions of NCERT class 12 chapter 13 exercise 13.2**

1 Exercise 13.2

1) If $P(A) = \frac{3}{5}$ and $P(B) = \frac{1}{5}$, find $P(A \cap B)$ if A and B are independent events.
2) Two cards are drawn at random and without replacement from a pack of 52 playing cards. Find the probability that both the cards are black.
3) A box of oranges is inspected by examining three randomly selected oranges drawn without replacement. If all the three oranges are good, the box is approved for sale, otherwise, it is rejected. Find the probability that a box containing 15 oranges out of which 12 are good and 3 are bad ones will be approved for sale.
4) A fair coin and an unbiased die are tossed. Let A be the event 'head appears on the coin' and B be the event '3 on the die'. Check whether A and B are independent events or not.
5) A die marked 1, 2, 3 in red and 4, 5, 6 in green is tossed. Let A be the event, 'the number is even, ' and B be the event, 'the number is red'. Are A and B independent?
6) Let E and F be events with $P(E) = \frac{3}{5}$, $P(F) = \frac{3}{10}$ and $P(E \cap F) = \frac{1}{5}$. Are E and F independent?
7) Given that the events A and B are such that $P(A) = \frac{1}{2}$, $P(A \cup B) = \frac{3}{5}$ and $P(B) = p$. Find p if they are
   a) mutually exclusive
   b) independent
8) Let A and B be independent events with $P(A) = 0.3$ and $P(B) = 0.4$. Find
   a) $P(A \cap B)$
   b) $P(A \cup B)$
   c) $P(A|B)$
   d) $P(B|A)$
9) If A and B are two events such that $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{8}$, find P(not A and not B)
10) Events A and B are such that $P(A) = \frac{1}{2}$, $P(B) = \frac{7}{12}$ and P(not A or not B) $= \frac{1}{4}$. State whether A and B are independent?
11) Given two independent events A and B such that $P(A) = 0.3$, $P(B) = 0.6$. Find
    a) $P(A$ and $B)$
    b) $P(A$ and not $B)$
    c) $P(A$ or $B)$
    d) P(neither A nor $B)$
12) A die is tossed thrice. Find the probability of getting an odd number at least once.
13) Two balls are drawn at random with replacement from a box containing 10 black and 8 red balls. Find the probability that
    a) both balls are red.
    b) first ball is black and second is red.
    c) one of them is black and other is red.
14) Probability of solving specific problem independently by A and B are $\frac{1}{2}$ and $\frac{1}{3}$ respectively. If both try to solve the problem independently, find the probability that
    a) the problem is solved
    b) exactly one of them solves the problem
15) One card is drawn at random from a well shuffled deck of 52 cards. In which of the following cases are the events E and F independent ?
    a) E: 'the card drawn is spade'
       F: 'the card drawn is an ace'
    b) E: 'the card drawn is black'
       F : 'the card drawn is a king'
    c) E : 'the card drawn is a king or queen'
       F : 'the card drawn is a queen or jack'
16) In a hostel, 60% of the students read Hindi newspaper, 40% read English newspaper and 20% read both Hindi and English newspapers. A student is selected at random.
    a) Find the probability that she reads neither Hindi nor English newspapers.
    b) If she reads Hindi newspaper, find the probability that she reads English newspaper.
    c) If she reads English newspaper, find the

probability that she reads Hindi newspaper.

Choose the correct answer in Exercises 17 and 18.

17) The probability of obtaining an even prime number on each die, when a pair of dice is rolled is
   a) 0
   b) $\frac{1}{3}$
   c) $\frac{1}{12}$
   d) $\frac{1}{36}$

18) Two events A and B will be independent, if
   a) A and B are mutually exclusive
   b) P(not $A \cap$ not B) = $[1 - P(A)]\,[1 - P(B)]$
   c) $P(A) = P(B)$
   d) $P(A) + P(B) = 1$