Seminar exercises

1. (a) Use the odds in favor of E and the fact that p + q = 1, to show that $q = {}^{n-m}/_{n}$

   (b) Whether forecast predicts 33% chances of rain at a daytime. What are the odds in favor and against raining in a day-time?
2. The odds against Manager X settling the wage dispute with the workers are 8:6 and odds in favor of manager Y settling the same dispute are 14:16.

   (i) What is the chance that neither settles the dispute, if they both try, independently of each other?

   (ii) What is the probability that the dispute will be settled?
3. The odds that person X speaks the truth are 3 :2 and the odds that person Y speaks the truth are 5:3. In what percentage of cases are they likely to contradict each other on an-identical point.
4. The odds in favour of E, that person X will clear is loan are 16:25. Find the % of chance that He will not clear is dept and its odds
5. The odds against a youth to live to 50 years at district X are 4:1. Find the odds in favour of E, p and q.
6. There is 10% chance that a woman delivered once with operation will give normal birth in her next delivery. Find the odds
7. The chance % of prevalence of microorganisms' illness: Malaria, Typhoid and U.T.I in children in district X is 10, 18 and 24 respectively. Find the odds of each illness.
8. A problem in Statistics is given to the two students whose chances of solving it are $1/2$ and $3/4$ respectively. What is the probability that the problem will be
   i. Solved by all
   ii. Not be solved
   iii. Solved, if all of them try independently?
9. The chances of winning of two race-horses are 1/3 and 1/6 respectively. What is the probability that at least one will win when the horses are running?
   a. in different races, and
   b. in the same race?

10. A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is 1/7 and that of wife's selection is 1/5. What is the probability that only one of them will be selected? What are the odds for each selection?

11. The probability of occurrence of an event A is 0·7, the probability of non-occurrence of another event B is 0·5 and that of at least one of A or B not occurring is 0·6. Find the probability that at least one of A or B occurs.

12. If A and B are mutually exclusive events and that P (A)= 1/2 and P (B) =1/3.

    Find P (A u B) and P (A n B).

13. If A and B are mutually exclusive events, show that

$$p(A/B') = \frac{p(A)}{1 - p(B)}$$

14. It is 8:5 against a husband who is 55 years old living till he is 75 and 4:3 against his wife who is now 48, living till she is 68. Find the probability that
    a. The couple will be alive 20 years hence, and
    b. At least one of them will be alive 20 years hence.

15. For two events *A* and *B* we have the following probabilities:

$$p(A) = p(A/B) = \frac{1}{4} \; and \; p(B/A) = \frac{1}{2}$$

    Check whether the following statements are true or false

    (i) *A* and *B* are ***mutually exclusive***

    (ii) *A* and *B* are ***independent***

    (iii) $p(A'/B) = \frac{3}{4}$

16. The odds against a certain event are 5 to 2 and odds in favour of another (independent) event are 6 to 5. Find the chance that at least one of the events will happen

17. The probability that a 50· years old man will be alive at 60 is 0·83 and the probability that a 45-years old woman will be alive at 55 is 0·87. What is the probability that a man who is 50 and his wife who is 45 will both be alive 10 years hence?

18. A man seeks advice regarding one of two possible courses of action from three advisers who arrived at their recommendations independently. He follows ***the recommendation of the majority***. The probability that the individual advisers are wrong are 0·1, 0·05 and 0·05 respectively. What is the probability that the man takes incorrect advice?

19. The chances of winning of. two race-horses are 1/3 and 1/6 respectively. What is the probability that at least one will win when the horses are running (a) in different races, and (b) in the same race?