Probability

1. A survey of 50 students at a certain college about the number of extracurricular activities resulted in the data shown.

No. of activities	0	1	2	3	4	5
frequency	8	20	12	6	3	1

a. Let A be the event that a student participates in at least 1 activity. Find P(A)

b. Let B be the event that a student participates in 3 or more activities. Find P(B)

c. What is the probability that a student participates in exactly 2 activities?

d. What is the probability that a student participates at most 2 activities?

2. What is the chance that a non-leap year should have fifty-three Sundays?

3. If two coins are tossed once, what is the probability of getting

a) both heads b) at least one head?

4. A card is drawn from a well shuffled pack of playing cards. Find the probability that it is

a) either a diamond or a king b) black or queen.

5. Mr. A and Mr. B both are interested to attend a seminar in central department of statistics, TU. The chance of attending a seminar by Mr. A is 0.6 and that by Mr. B is 0.3. They both can also attend the seminar. What is the probability that at least any one of them will attend the seminar?

6. The probability that an integrated circuit chip will have defecting etching is 0.12, the probability that it will have a crack defect is 0.29, and the probability that it has both defect is 0.07.

a) What is the probability that a newly manufactured chip will have at least one of two defects?
b) What is the probability that a newly manufactured chip will have neither any kind of defect?

6. The salesman has a 60% chance of making a sale to each customer. The behavior of successive customers is independent. If two customer A and B enter, what is the probability that the salesman will make a sale to A or B?

7. A bag contains 7 red, 12 white and 4 green balls. Three balls are drawn randomly. What is the probability that,

a) 3 balls are all white
b) 3 balls are one of each color?
c) 3 balls are same color?

8. A bag contains 3 red, 4 white and 9 black balls. Three balls are drawn randomly. What is the probability that,

a) all are black
b) all are of different color

9. There are 3 economists, 4 engineers, 2 statisticians and 1 doctor. A committee of 4 from among them is be formed. Find the probability that the committee

a) consists one of each kind
b) has at least one economist
c) has the doctor as a member and three others.

10. During a study of an auto accident, the highway safety council found that 60% of all accidents occur at night, 52% are alcohol-related, and 37% occur at night and are alcohol-related.

a) What is the probability that an accident was alcohol-related, given that it occurred at night?
b) What is the probability that an accident occurred at night, given that it was alcohol-related?

11. There are three machines A, B, and C producing 1000, 2000 and 3000 articles per hour respectively. These machines are known to be producing 1%, 2% and 3% defectives respectively. One article is selected at random form an hour production of the three machines and found to be defective. What is the probability that the article is produced from:

a) Machine A
b) Machine B?

12. In a certain factory, machines I, II, and III are all producing springs of the same length. Of their production, machine I, II and III produce 2%, 1% and 3% defective springs respectively. Of the total production of spring in the factory, machine I produces 35%, machine II produces 25% and machine III produces 40%. If one spring is selected at random from the total spring produced in a day, find

a) The probability that it is defective
b) The conditional probability that it was produced by machine III.