

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICAL SCIENCES
DHAHRAN, SAUDI ARABIA

STAT 319: PROBABILITY & STATISTICS FOR ENGINEERS & SCIENTISTS

Mid Term Exam No.2, Semester 052
Time: 7.30- 9.00 p.m., April 18, 2006

Please CIRCLE the name of your instructor; Write CLEARLY your name and Section Number. Not doing so will cost you ONE mark each.

Instructors:

Musawar Malik,
Ibrahim Rahimov,
Anwar Joarder.

Student Surname:

ID#

Section #

Question No	Full Marks	Marks Obtained
1	10	
2	5	
3	10	
4	10	
5	10	
6	5	
Total	50	

1. (marks 6+4). Many people believe that they can tell the difference between Coke and Pepsi. Other people say that the two brands can't be distinguished. To test this, a random sample of 20 adults was selected to participate in a test. After being blindfolded, each person was given a small taste of either Coke or Pepsi and asked to indicate which brand soft drink it was. Assume that the people really can't tell the difference. In other words, they have 50% chance of guessing correctly.

a) Find the probability that fewer than 3 people will guess correctly.

b) What is the expected number of people who guess correctly?

2. (marks 5). A company has twenty cars that are available for use by company executives for official business purposes. Six of these cars are SUVs, eight are luxury type cars, and the rest are basic sedans. Suppose the cars are randomly assigned each week. If five cars are put into use, what is the chance that none of the SUVs or luxury cars will be in the group?

3. (marks 5+5). Sam will read either one chapter of his probability book or one chapter of his history book. If the number of misprints in a chapter of his probability book is **Poisson** distributed with mean 2 and if the number of misprints in his history book is Poisson with mean 5. Assume Sam is equally likely to choose either book.

a. What is the probability that he will come across 2 misprints in a chapter of his probability book?

b. What is the expected number of misprints that Sam will come across in a chapter?

4. (marks 4+6). Suppose that the number of miles that a car can run before its battery wears out is exponentially distributed with an average value of 10,000 miles.

a. If a person desires to take a 5000-mile trip, what is the probability that he will be able to complete the trip without having to replace the car battery?

b. If two friends will take the 5000-mile trip by two cars, what is the probability that exactly one of them will replace the battery of his car?

5. (marks 5+5). An IQ test produces scores that are normally distributed with mean value 100 and standard deviation 14.2.

a) What is the proportion of scores which exceed 128?

b) What is smallest score in top 1% of all scores?

6. (marks 5) Suppose that the population distribution of the gripping strength of industrial workers is known to have a mean of 110 and a standard deviation of 5. For a random sample of 75 workers, what is the probability that the sample mean gripping strength will be between 109 and 111?