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

STAT 319: PROBABILITY & STATISTICS FOR ENGINEERS & SCIENTISTS

Major Exam 1, Semester-023 (2003)
Time: 7:30 pm to 9:00 pm. Tuesday July 15, 2003

Instructor: Musawar Amin Malik

Student Name: ID# Section #

Answer all questions. You are allowed to use any electronic calculator.

Question No	Marks	Marks Obtained
1	8	
2	8	
3	3	
4	3	
5	4	
6	5	
7	5	
8	4	
Total	40	

1. Consider the following humidity readings rounded to the nearest percent:

29	44	12	53	21	34	39	25	48	23
17	24	27	32	34	15	42	21	28	37

(a). Construct a frequency distribution and histogram starting from 10 and with a width (step size) of the intervals 10 and comment on the shape of the histogram. (2+2+1).

(b). Calculate the Mean and Standard Deviation of the grouped data. (1+2).

2. The following measurements of the diameters (in feet) of Indian mounds in southern Wisconsin were gathered by examining reports in the Wisconsin Archeologist.

22 24 24 30 22 20 28 30 24 34 36 15 37

(a). Find the proportion of the observations that are in the intervals $\bar{x} \pm 2s$ Compare the result with the empirical rule. (4+2).

(b). Calculate the co-efficient of skewness and interpret. (1+1).

3. A husband and wife have three children. If B denotes a boy and G denotes a girl. Determine the following

   a. Sample space that describes all the orders of the possible sexes of the children. (2)

   b. The event that at least one child is a boy. (1).

4. There are 300 students in a Math course of which 140 are Management students and remaining Engineering students. It is known that 80 percent of Management and 60 percent of the Engineering students have their driver's license. If a student is selected at random from this math course
   What is the probability that the student is a Management student and has a driver license? (3).

5. In a certain state, 45% of all major manufacturers violate some federal pollution standard and 30% violate both a state and federal pollution standard. Given that a major manufacturer violates a federal standard, what is the probability the manufacturer violates a state pollution standard? (4).

6. Let $P(E) = \frac{1}{2}$ and $P(E \cup F) = \frac{3}{4}$

   a. Compute P (F). If E and F are independent events. (2).

   b. Compute P (F). If E and F are mutually exclusive events. (3).

7. In a certain residential area 60% of all households subscribe to the national newspaper, 80% subscribe to the afternoon paper and 50% of all households subscribe to both papers. If a household is selected at random, what is the probability that it subscribes to

a. at least one of the two newspapers. (2).

b. exactly one of the two newspapers. (3).

8. Suppose that of all individuals buying a certain personal computer, 60% include a word processing program in their purchase, 40% include a spreadsheet program, and 30% include both types of programs. Consider randomly selecting a purchaser and let A = (word processing program included) and B = (spreadsheet program included).

a. Find the probability that a word processing program was included given that the selected individual included a spreadsheet program. (2).

b. Find the probability that a spreadsheet program was included given that the selected individual included a word processing program. (2).