MIDTERM 1B–STAT 100–FALL 1996

You may use calculators, but not books or notes. Each problem is worth 20 points. Do not spend too much time on any one problem. Put a box around the final answer to a question.

1. Given is the following sample data: 25, 6, 1, 7, 13 , 5.
For this data, calculate the following (5 points each): (a) the sample mean,
(b) the sample standard deviation, (c) the median, (d) the interquartile range.

2. Determine which of the following are legitimate probability distributions. Give reasons for your decisions.

(A)

x	f(x)
2	1/3
4	1/3
6	1/3

(B)

x	f(x)
-2	-.1
-3	.5
6	.6

(C)

x	f(x)
0	.7
2	.3
-4	.01

(D)

x	f(x)
2	1/3
4	2/3
6	0

3. Suppose A, B and C are three events such that B and C are mutually exclusive, A and B are independent, $P(A)=.7$, $P(B)=.1$ and $P(C\overline{B})=.3$.
Calculate the following:
a. $P(BC)$ b. $P(A|B)$ c. $P(A \cup B)$ d. $P(B|\overline{A})$

4. An IRS agent receives a batch of 15 tax returns that were flagged by computer for possible tax evasions. Of these returns, 6 have illegal deductions and the other 9 are in good standing. Suppose the agent randomly audits 4 of these returns. Compute the probabilities that
a. none of the returns with illegal deductions are selected
b. at least two of the returns with illegal deductions are selected.

5. In a certain batch of inferior firecrackers, the probability that a firecracker explodes when lit is only .3. Rosco will light 25 of these firecrackers.
a. What is the probability that exactly 10 of them explode?
b. What is the probability that at most 10 explode?
c. What is the probability that at least 10 explode?
d. What is the expectation of the number which will explode?