FINAL EXAMINATION

ATTEMPT ANY FIVE QUESTIONS

Question 1.

A sample of 10 is drawn randomly from a certain population. The sum of the squared deviations from the mean of the given sample is 50. Test the hypothesis that the variance of the population is 5 at 5 per cent level of significance.

Question 2.

The following information is obtained concerning an investigation of 50 ordinary shops of small size:

	Shops		*Total*
	In towns	*In villages*	
Run by men	17	18	35
Run by women	3	12	15
Total	20	30	50

Can it be inferred that shops run by women are relatively more in villages than in towns? Use χ^2 test.

Question 3.

A housewife buys 3 kinds of cereals, A, B and C. She never buys the same cereal in successive weeks. If she buys cereal A, the next week she buys B. However, if she buys B or C, the next time she is 3 times as likely to buy A as the other cereal. In the long ron, how often does she buy each of the three cereals?

Question 4.

A man either drives a car or catches a train to go to the office each day. He never goes 2 days on a row by train but if he drives one day, then the next day he is just as likely to drive again as he is to travel by train. Suppose that on the first day of the week, the man tossed a fair dice and drove to work if and only if a six appeared. Find:

1. The probability that he takes a train on the third day and,

2. The probability that he drives to work in the long run.

Question 5.

A student's study habits are as follows. If he studies one night, he is 70% sure not to study next night. On the otherhand, the probability that he does not study two nights in succession is 0.6. In the long run, how often does he study?

Question 6.

Patients arrive randomly and independently at a doctor's consulting room from 8.00 A.M at an average rate of 1 every 5 minutes. The waiting room can hold 12 persons. What is probability that the room will be full when the doctor arrives at 9A.M?

Question 7.

Suppose that customers arrive at a bank according to a Poisson process with a mean rate of 3 per minute. Find the probability that during a time interval of 2 minutes.

1. Exactly 4 customers arrive
2. Less than 4 customers arrive
3. More than 4 customers arrive