1-a) Explain the terms i) Null hypothesis
ii) Type I and Type II errors

b) The nine items of a sample have the

values 45, 47, 50, 52, 48, 47, 49, 53, 51.

Does the mean of these differ significantly

from the assumed mean of 47.5?

c) Given the matrix $A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ \frac{1}{2} & \frac{1}{2} & 0 \end{bmatrix}$ then show

that A is a regular stochastic matrix.

2.a) A die was thrown 9000 times and of these

3220 yielded a 3 or 4. Can the die be

regarded as unbiased?

b) Explain i) Transient state ii) Absorbing state

iii) Recurrent state

c) A student's study habits are as follows.

If he studies one night, he is 70% sure

not to study the next night. On the other hand, if he does not study one night, he is 60% sure not to study the next night. In the long run, how often does he study?

Paper - 2

1 a) Repeated   b) Repeated

c) significant level. (Explan in terms)

2) Repeated

3) Find the unique, fixed probability vector for the regular stochastic matrix.

$$A = \begin{bmatrix} 0 & 1 & 0 \\ 1/6 & 1/2 & 1/3 \\ 0 & 2/3 & 1/3 \end{bmatrix}$$

4) a) A certain stimulus administered to each of the 12 patients resulted in the following Change in blood pressure ($t_{0.05}$ for 11 d.f = 2.201)

b) it has been found that the mean breaking strength of a particular brand of thread is 275.6 gms with $\sigma = 39.7$ gms. A sample of 36 pieces of thread showed a mean breaking strength of 253.2 gms. test the claim at 1% ... and 5% level of significance.

c) A man's smoking habits are as follows. if he smokes filter cigarettes one week, he switches to non filter cigarettes the next week with probability 0.2 one the other hand. if he smokes non filter cigarettes one week there is a probability of 0.7 that he will smoke non filter cigarettes the next week as well. In the long run how often does he smoke filter cigarettes?

Paper - 3

1 a) In 324 throws of a six faced 'die' an odd number turned up 181 times. Is it reasonable to think that the 'die' is unbiased?

b) Two horses A and B were tested according to the time (in seconds) to run a particular race with the following results.

Horse A :	28	30	32	33	33	29	34
Horse B :	29	30	30	24	27	29	

Test whether you can discriminate between the two horses ($t_{0.05} = 2.2$ and $t_{0.02} = 2.72$ for 11 df)

c) Repeated

2_a) Define in terms i) Repeated   ii) Repeated

iii) Confidence limits

b) Prove that the Markov chain whose.

t.p.m $P = \begin{bmatrix} 0 & 2/3 & 1/3 \\ 1/2 & 0 & 1/2 \\ 1/2 & 1/2 & 0 \end{bmatrix}$ is irreducible. Find the

Corresponding stationary probability vector.

c) Three boys A. B. C are throwing ball to each other. A always throws the ball to B and B always throws the ball to C.

C is just as likely to throw the ball to B as to A. If C was the first person to throw the ball find the probabilities that after three throws

i) A has the ball

ii) B has the ball

iii) C has the ball.