

- b) Find the most likely price in Bombay corresponding to the price of Rs.70 at Calcutta from the following :

	Calcutta	Bombay
Average price	65	67
Standard deviation	2.5	3.5

Correlation coefficient between the prices of commodities in the two cities is 0.8. (8)

OR

6. a) Explain the method of least squares. Fit a second degree parabola to the following data:

x:	1.0	1.5	2.0	2.5	3.0	3.5	4.0
y:	1.1	1.3	1.6	2.0	2.7	3.4	4.1

(8)

- b) The ranks of same 16 students in Mathematics and Physics are as follows. Two numbers within brackets denote the ranks of the students in Mathematics and Physics. (1,1) (2,10) (3,3) (4,4) (5,5) (6,7) (7,2) (8,6) (9,8) (10,11) (11,15) (12,9) (13,14) (14,12) (15,16) (16,13).

Calculate the rank correlation coefficient for proficiencies of this group in Mathematics and Physics. (8)

Unit - IV

7. a) Write a short note on M/M/1 models and their applications. (8)
- b) Trains arrive at the yard every 15 minutes and the service time is 33 minutes. If the line capacity of the yard is limited to 5 trains find the probability that the yard is empty and the average number of trains in the system. (8)

OR

8. a) Customers arrive at a sales counter manned by a single person according to a Poisson process with a mean rate of 20 per hour. The time required to serve a customer has an exponential distribution with a mean of 100 seconds. Find the average waiting time of a customer. (8)
- b) Patients arrive at a clinic according to Poisson distribution at a rate of 30 patients per hour. The waiting room can not accommodate more than 14 patients. Examination time per patient is exponential with mean rate of 20 per hour.
- Find the effective arrival rate at the clinic.
 - What is the prob. that an arriving patient will not wait?
 - What is the expected waiting time until a patient is discharged from the clinic?