

TILAK MAHARASHTRA VIDYAPEETH
Department of Distance Education

Masters of Business Administration (Distance)

Home Assignment – Sem-I
(2011-12)

Marks : 80

Subject : Quantitative Methods

Code : MBA 106

Note :

- * The Paper consists of two sections I & II
- * Questions from Section I carry equal marks
- * Section II is Compulsory

Section I

- Q.1 For three consecutive months, a person deposits some amount of money on the first day of each month in small saving fund. These three successive amounts in the deposit, the total value of which is Rs.65, form a G.P. If the two extreme amounts be multiplied each by 3 and the mean by 5, the products form an A.P. Find the amount in the first and second deposits. (15)

OR

- Q.1 Mr. X has invested a part of his investment in 10% bond A and a part in 15% bond B. His interest income during first year is Rs.4, 000. If he invests 20% more in 10% bond A and 10% more in 15% bond B, his income during second year increases by Rs. 500. Find his initial investment and the new investment in bonds A and B using matrix method.
- Q.2 Mr. Gupta, a retired government servant is considering investing his money in two proposals. He wants to choose the one that has higher average net present value and lower standard deviation. The relevant data are given below. Can you help him in choosing the proposal?

| Proposal | Net Present Value (NPV) | Chance of the possible outcome of NPV |
|----------|-------------------------|---------------------------------------|
| A | 1559 | 0.30 |
| | 5662 | 0.40 |
| | 9175 | 0.30 |
| B | -10050 | 0.30 |
| | 5812 | 0.40 |
| | 20584 | 0.30 |

(15)

OR

- Q.2 Obtain the two Regression Equations from the following bivariate frequency distribution:

| Sales Revenue (Rs. in lakhs) | Advertising Expenditure (Rs. in Thousands) | | | |
|---------------------------------|--|---------|---------|---------|
| | 5 – 15 | 15 – 25 | 25 – 35 | 35 – 45 |
| 75 – 125 | 3 | 4 | 4 | 8 |
| 125 – 175 | 8 | 6 | 5 | 7 |
| 175 – 225 | 2 | 2 | 3 | 4 |
| 225 – 275 | 3 | 3 | 2 | 2 |

Estimate

- (a) The sales corresponding to advertising expenditure of Rs. 50,000,
- (b) The advertising expenditure for sales revenue of Rs. 300 lakhs,
- (c) The coefficient of correlation.

- Q.3 Assume that the test scores from a college admissions test are normally distributed with a mean of 450 and a standard deviation of 100.
- What percentage of people taking the test score are between 400 and 500?
 - Suppose someone received a score of 630. What percentage of the people taking the test score better? What percentage score worse?
 - If a particular University will not admit any one scoring below 480, what percentage of the persons taking the test would be acceptable to the University?
- (15)

OR

- Q.3 The following table relates to the tourist arrivals (in millions) during 1994 to 2000 in India:

| Year | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|-------------------|------|------|------|------|------|------|------|
| Tourists arrivals | 18 | 20 | 23 | 25 | 24 | 28 | 30 |

Fit a straight line trend by the method of least squares and estimate the number of tourists that would arrive in the year 2004.

- Q 4 **Write short Notes.** (Any 3) (15)
- Classification and Tabulation
 - Ogive Curve
 - Markov Chains
 - Forecasting
 - Mathematical Basis of Management Decision

Section II

(20)

- Q. 5. Alpha Heavy Engineering Company produces earthmovers and harvesters. Each product passes through two assembly departments A and B, which, respectively, have 300 hours and 320 hours of available time for the next month's production. Each earthmover requires 20 hours in department A and 40 in B department and each harvester requires 30 hours in department A and 20 in department B. The two products are tested in a third department. Each earthmover is given 60 hours of testing and each harvester 20, and, as per the agreement with the labour union, the total labour hours devoted to testing cannot fall below 270. The management has the operating policy of manufacturing at least one harvester for every two earthmovers produced. A major customer has placed an order for a minimum of 5 earthmovers and harvesters (in any two combination, whatever) for next months, and, so, at least that many must be produced. Each earthmover gives a profit of Rs. 10,000 and each harvester Rs. 8,000. Formulate the problem mathematically and solve it graphically.