

I Semester M.B.A. (Day) Examination, January 2009
(2007-08 Scheme)
MANAGEMENT

1.5 : Business Mathematics and Analytics

Time : 3 Hours

Max. Marks : 75

Instruction : Calculators and tables are allowed.

SECTION - A

Answer any 6 questions. Each question carries 2 marks.

(2×6=12)

1. a) Distinguish between 'maxima and minima'.
- b) List out the characteristics of statistics.
- c) What are the limitations of binomial distribution ?
- d) What is decision making under uncertainty ?
- e) What are the advantages of stratified random sampling ?
- f) What is standard error ?
- g) What is index number ?
- h) What is correlation ?
- i) What is regression ?

SECTION - B

Answer any three questions. Each question carries 8 marks.

(3×8=24)

2. a) Explain addition, subtraction and multiplication of matrices with examples.
- b) From the following information determine the units to be manufactured in order to earn maximum profit.

$$T_C = 0.0008x^2 + 3.4x + 25,000 \text{ and } TR = -0.001x^2 + 25x.$$

P.T.O.



3. a) What is a statistical average ? State the properties of a good average.
- b) Five students P, Q, R, S and T are given a problem to solve. The probabilities are $P - \frac{1}{3}$, $Q - \frac{1}{5}$, $R - \frac{1}{6}$, $S - \frac{1}{8}$ and $T - \frac{1}{9}$ of solving the problem. What is the probability that the problem will be solved ?
4. a) With an example of your own, discuss the research design of a proposed survey.
- b) For a group of 20 items, $\sum X = 1452$, $\sum X^2 = 144280$ and mode = 63.7. Find the Pearsonian coefficient of skewness.
5. The mean and standard deviation of marks obtained by the candidates in a competitive examination are 50 and 15 respectively. If 1200 candidates appear for the examination, find :
- The number of candidates who are expected to score more than 70.
 - The expected number of candidates who score between 60 and 75 marks.
 - The number of candidate who may score less than 40 marks.
 - The number of candidates who may score between 35 and 55 marks.
6. Using the following data, show that Fisher's index satisfies time reversal test and factor reversal test.

Item	2005		2007	
	Price	Quantity	Price	Quantity
P	5	6	6	7
Q	7	12	6	13
R	6	15	8	15
S	8	10	8	12



SECTION - C

Answer any two questions. Each question carries 12 marks. (2×12=24)

7. a) Explain the applications of statistics in managerial decision-making. Also discuss the limitations of statistics.

b) What is sampling ? Why is it important ? Discuss the methods of sampling.

8. A businessman has two independent investments A and B available to him, but he lacks the capital to undertake both of them simultaneously. He can choose to take A first and then stop or if A is successful, then take B or vice-versa. The probability of success on A is 0.7, while for B, it is 0.4. Both investments require an initial capital outlay of Rs. 20,000 and both return nothing if the venture is unsuccessful. Successful completion of A will return Rs. 30,000 (over cost), whereas successful completion of B will return Rs. 50,000 (over cost). Draw the decision tree and determine the best strategy.

9. a) ABC Ltd. gives the following information relating to the sales of refrigerators in the past ten years :

Years : 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

Refrigerators

sold in thousands: 8 10 11 11 18 15 19 19 22 24

Fit a straight line trend by the method of least squares and estimate the sales for 2009.

b) Calculate the coefficient of correlation and the probable error and comment on the significance of correlation for the following data :

X	6	7	7	9	10	12
Y	18	16	17	19	19	21



SECTION - D
(Case Study)

This is a compulsory question.

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10. A study was carried out on the advertising methods of a brand of product. The unit sales achieved by five stores were recorded as under :

	Store A	Store B	Store C	Store D	Store E
Method - I	78	85	82	88	79
Method - II	93	87	85	85	85
Method - III	81	92	77	83	81
Method - IV	79	83	71	78	78

Calculate the F-ratio, using ANOVA and 5% level of significance. Establish whether a) four methods of advertisement produce different effects on the sales volumes and b) there is a significant difference between the sales in the different stores.

X	6	7	7	9	10	12
Y	16	16	17	19	19	21