

I Semester M.B.A. (Day/Evening) Degree Examination,
Jan./Feb. 2006
(Updated Scheme)

MANAGEMENT

1.3 : Mathematics and Statistics

Time: 3 Hours

Max. Marks: 75

Instruction : Calculators and Statistical Tables are allowed.

SECTION – A

Answer **any six** questions :

(6×2=12)

1. a) How is statistics useful in managerial decision making ?
- b) What is correlation ? What is its significance ?
- c) What are the statistical techniques of business forecasting ?
- d) What do you understand by regression analysis ?
- e) What are averages ? How are they useful ?
- f) What do you understand by measures of dispersion ?
- g) Find the sum of the first 20 terms of an AP, 2, 5, 8,
- h) Give one example for each of the following :
 - i) Linear function
 - ii) Geometric progression.
- i) Find the sum of the first 8 terms of a G.P. 4, 8, 16,

SECTION – B

Answer **any four** questions :

(4×5=20)

2. Briefly explain the procedure for setting up and testing of a hypothesis.
3. In an intelligence test administered to 500 students, the average score was 42 and standard deviation was 24. Find :
 - a) The number of students whose score exceeded 50.
 - b) The number of students who got a score between 30 and 40.
 - c) The number of students who got a score above 60.

P.T.O.

4. 2000 families of a city were selected at random to test the belief that families with higher income bought the sedan-type of car and families with lower income bought the small car. Given the following results, use the chi square test to find out if the belief is true :

Income	Sedan type of car	Small car	Total
High	594	606	1200
Low	262	538	800
Total	856	1144	2000

5. Fit a straight line trend by the method of least squares to the data given below and project the probable sales for the next two years : (A graph is not necessary)

Year	1999	2000	2001	2002	2003	2004
Sales (in Thousands of Rupees)	164	180	186	187	190	192

6. Calculate whether there is any correlation between the salaries and the amount spent on car maintenance. Use Karl Pearson’s method for correlation, determine the probable error and comment on the significance of correlation :

Average Salary in Rs.	10,000	12,000	15,000	18,000	20,000
Car Maintenance in Rs.	750	900	1,200	1,500	2,000

7. a) If the opening stock matrix is $\rightarrow \begin{vmatrix} 3 & 5 \\ 4 & 2 \end{vmatrix}$, the closing stock matrix is $\rightarrow \begin{vmatrix} 2 & 3 \\ 3 & 2 \end{vmatrix}$, the sales unit matrix is $\rightarrow \begin{vmatrix} 4 & 3 \\ 3 & 4 \end{vmatrix}$, the sales price per unit is Rs. 2 per unit, find the purchases matrix.
- b) The share prices of share C in a week were 52, 55, 54, 49, 47 and 51, whereas the share prices of share D in that week were. 75, 74, 69, 77, 80, 72 and 76 Find out which share is more stable in price fluctuations.

SECTION - C

Answer **any three** questions :**(3×10=30)**

8. What is sampling ? Explain the various methods of sampling.
9. Obtain the regression equations for the following data :

Operator	A	B	C	D	E	F	G	H
Experience in years (X)	17	13	19	5	4	11	6	14
Production in units day (Y)	86	87	88	67	77	79	74	82

10. Calculate fisher's ideal index and test for the factor reversal test and the time reversal test for the following data :

Commodity	A	B	C	D	E
P_0	30	32	30	31	32
Q_0	95	115	120	125	125
P_1	22	24	25	27	28
Q_1	215	220	219	222	224

11. The cost function is given as $C = 6x^3 + 4x^2 + 2$, find, if $x = \text{Rs. } 8$,
- The average cost function and the average cost.
 - The marginal cost function and the marginal cost.
 - The revenue function if the price per unit is Rs. 250 and the revenue.
 - The profit function and the profit.
12. A company has 5 showrooms in 5 cities selling the same model of car. The number of cars sold over 4 months is given below. Using ANOVA, advice the company whether there is a significant difference in the sales among the different showrooms.

Months	Showroom A	Showroom B	Showroom C	Showroom D	Showroom E
September	8	9	7	6	9
October	10	11	8	9	9
November	8	10	9	11	10
December	7	10	8	9	9

SECTION - D

Case Study :

13. An investor has 3 options to invest, but he can invest in only one option at a time. He can invest either in a departmental store, a cold storage or in a car maintenance shop.

If he invests in a departmental store and succeeds, he can invest in the cold storage, and if he succeeds, he can invest in the car maintenance shop.

If he invests in the cold storage and succeeds, he can invest in the car maintenance shop and if he succeeds, he can invest in the departmental store.

If he invests in the car maintenance shop, and succeeds, he can invest in the cold storage and if he succeeds, he can invest in the departmental store. Based on the data given below, draw a decision tree and advice the investor on the best decision to take.

	Probability of success	Investment	Loss on failure
Departmental Store	0.65	8,00,000	45,000
Cold storage	0.60	7,50,000	40,000
Car maintenance shop	0.70	7,40,000	3,50,000