PG – 859

I Semester M.B.A. Degree Examination, January/February 2015
(2007 – 08 Scheme)
Paper – 1.5 : BUSINESS MATHEMATICS AND STATISTICS (BUMASTICS)

Time : 3 Hours Max. Marks : 75

Instructions : *1) Calculators and appropriate statistical tables are **allowed**.*
2) Provide the Graph sheet.

SECTION – A

Answer **any six** of the following. **Each** sub-question carries **two** marks. **(6×2=12)**

1. a) What is a hypothesis ?
   b) What is an average ?
   c) What are the differences between correlation and regression ?
   d) What is standard deviation ?
   e) What is Time Series analysis ?
   f) Find the sum of first 10 terms of an AP, 2, 5, 8 ...
   g) Find the determinant of the matrix

$$A=\begin{bmatrix} 3 & -2 & 1 \\ 1 & 0 & 1 \\ 2 & 7 & -8 \end{bmatrix}$$

   h) What is a decision tree ?

SECTION – B

Answer **any three** questions. **Each** question carries **eight** marks. **(3×8=24)**

2. What is correlation ? Distinguish between positive and negative correlation. What is the significance of coefficient of correlation ?

3. Fit a straight line trend for the following data and forecast the sales figure for the next year (A graph is necessary).

Year	**2009**	**2010**	**2011**	**2012**	**2013**
Sale of Sugar ('000 kgs)	80	90	92	93	94

P.T.O.

4. The share prices of share Alpha Company in a week were

   Rs. 55, 56, 57, 52, 59, 50 and 54.

   Where as the share prices of Beta Company were

   Rs. 78, 77, 72, 80, 83, 70 and 74.

   Which out of these two companies, the share price is more stable in price fluctuations ?

5. 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**

6. The following data relate to the age of 10 employees and the number of days on which they reported sick in a month.

Age	20	30	32	35	40	46	52	55	58	62
Sick days	1	2	0	3	4	6	5	7	8	9

   Calculate Karl Pearson's coefficient of correlation and interpret it.

SECTION – C

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

7. If the cost function is given as

   $C = 5x^3 + 3x^2 + 6$, find :

   a) The average cost function and the average cost

   b) The marginal cost function and the marginal cost

c) The revenue function if the price per unit is Rs. 250, and the revenue.

d) The profit function and the profit.

8. What is Sampling ? Explain the various methods of Sampling.

9. Calculate the 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

SECTION – D

(Compulsory) **(1×15=15)**

10. A company 'X' has 2 options to sell its products. It can set up a showroom in the city or can sell from his factory outlet. Setting up a showroom will cost Rs. 5,00,000 with a 60% probability of success. If the showroom succeeds, it can gross a net profit of Rs. 10,00,000 per year. If it fails, it can close the showroom or rent it out for an annual rent of Rs. 2,40,000 (for the rent of the year). The probability of getting rent is 80%.

    If it sells from the factory outlet, it has to incur Rs. 50,000 as renovation charges. The chances of successful selling here is 40% with a net profit of Rs. 4,00,000 per year.

    a) What will be your advise to the company ?

    b) If you are hired as a consultant, advice the company on how a decision tree will help the company and its manager to make decisions ?