**I Semester M.B.A. (Day) Examination, February/March 2014**
**(2007-08 Scheme)**
**MANAGEMENT**
**Paper – 1.5 : Business Mathematics and Statistics**

Time : 3 Hours                                                                                   Max. Marks : 75

**Instructions :** * *Calculators and appropriate statistical tables are* **allowed**.
* *Provide the graph sheets.*

## SECTION – A

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

1. a) Define "diagonal matrix".

   b) What do you mean by the term ratio ?

   c) What is dispersion ? Why is it important ?

   d) State the classical theory of probability.

   e) What is lag and lead in correlation ?

   f) Distinguish between point estimation and interval estimation.

   g) What is meant by ANOVA ?

   h) What are the business uses of index numbers ?

## SECTION – B

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

2. Explain the role of Statistics in managerial decision-making. Illustrate with examples.

3. What is sampling ? Explain the different methods of sampling.

4. The total cost and total revenue functions for a product are :

$TC_{(x)} = 300 + 20x + 0.1x^2$ and $TR_{(x)} = 60x$.

Using the marginal approach, determine the profit maximizing level of output. What is the maximum profit ?

5. From the following data, find the straight line trend and forecast the production figures for the next two years of a certain company

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|
| Production in '000 Kgs | 64 | 70 | 82 | 68 | 75 | 88 | 90 | 94 |

A graph is necessary.

6. In a certain company training was provided to employees in interpersonal skills to avoid conflicts. From the following data determine whether the training was effective. You may use a 5 percent significance level :

| Details | Involved in Conflicts | Not involved in Conflicts |
|---|---|---|
| Trained | 884 | 425 |
| Not trained | 266 | 198 |

SECTION – C

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

7. Explain addition, subtraction, division and multiplication of matrices with examples.

8. Find the correlation coefficient and the regression equations for the following data :

| X | 12 | 24 | 30 | 45 | 56 | 70 | 83 |
|---|---|---|---|---|---|---|---|
| Y | 29 | 31 | 44 | 56 | 72 | 88 | 90 |

9. Construct Laspeyres, Paasche's and Fisher's ideal index for the following data and prove that Fisher's ideal index satisfies the time reversal and factor reversal tests.

|  | 2012 | | 2013 | |
|---|---|---|---|---|
| Commodity | Price | Quantity | Price | Quantity |
| A | 2 | 8 | 4 | 6 |
| B | 5 | 10 | 6 | 5 |
| C | 4 | 14 | 5 | 10 |
| D | 2 | 19 | 2 | 13 |

## SECTION – D
## (Compulsory)                                                    (1×15=15)

10. The following represent the number of units of production per day turned out by four different workers using five different types of machines.

### Machine Type

| Workers | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | 4 | 5 | 3 | 7 | 6 |
| 2 | 6 | 8 | 6 | 5 | 4 |
| 3 | 7 | 6 | 7 | 8 | 8 |
| 4 | 3 | 5 | 4 | 8 | 2 |

On the basis of this information, can it be concluded that

a) The mean productivity is the same for different machines ? and

b) The workers do not differ with regard to their productivity ?

You may use a 5 per cent significance level.

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