Unique Paper Code : 52411202_OC

Name of the Paper : Business Mathematics and Statistics

Name of the Course : B.Com

Semester : II

Duration : 2 hours

Maximum Marks : 75

Attempt any four questions. All questions carry equal marks.

1. The share prices of Reliance Ltd. and Infosys Ltd. recorded for 10 days are given below:

| Days | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Share prices (Rs.) | Reliance Ltd. | 1100 | 1150 | 1120 | 1240 | 1200 | 1210 | 1290 | 1290 | 1310 | 1300 |
| | Infosys Ltd. | 150 | 130 | 120 | 140 | 140 | 130 | 170 | 140 | 110 | 160 |

Which company's share prices are more consistent?

Also calculate the combined average price and the combined variance of share prices for the two companies taken together.

2. Using the following information about Aptitude scores (X) and Productivity Index (Y) of workers, calculate:
    - Karl Pearson's coefficient of correlation
    - Two regression coefficients
    - Two regression equations
    - Estimated productivity index of a worker whose aptitude test score is 460

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What is the relationship between correlation and regression coefficients?

3. Which is the best method for construction of Index Numbers? Explain why. Show whether this index satisfies the various tests of adequacy of index number formulae.

4. Explain the Moving Average Method of determining trend values. Compare it with the method of least squares in terms of its merits and limitations.
   Compute 4-yearly moving averages for the following data:

| Year | Profits (in Thousands INR) | Year | Profits (in Thousands INR) |
|---|---|---|---|
| 2008 | 24 | 2014 | 98 |
| 2009 | 28 | 2015 | 94 |
| 2010 | 34 | 2016 | 112 |
| 2011 | 42 | 2017 | 132 |
| 2012 | 52 | 2018 | 154 |
| 2013 | 64 | 2019 | 178 |

5. A firm's average cost function is and its demand function is where x and p represent quantity and price respectively. Determine the levels of output (x) that (i) maximizes total revenue, (ii) minimizes marginal cost, (iii) maximizes profit.

6. A machine costing Rs.1,50,000 depreciates at the rate of 7% p.a. for the first 2 years, at 10% p.a. for the next 4 years and then at 12% p.a. (depreciation being calculated on the diminishing value). Find the book value of the machine at the end of 10 years and the amount of depreciation provided for the $10^{th}$ year. Also find the average rate of depreciation.