LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **COMMERCE**

THIRD SEMESTER – **NOVEMBER 2012**

# ST 3104/3101 - BUSINESS STATISTICS

 Date : 07/11/2012 Dept. No. Max. : 100 Marks

 Time : 9:00 - 12:00

**SECTION – A**

**Answer All the Questions: ( 10 x 2 =20)**

1. Define the term Statistics
2. How are statistics being mis-used? Give anyone mis-interpretation of statistics.
3. Define Weighted Arithmetic Mean.
4. Why is median called a positional average?
5. State the properties of Pearson’s correlation coefficient.
6. What is meant by regression analysis?
7. What is the scatter diagram?
8. What are the uses of index numbers?
9. Define trend and seasonal variation.
10. State the components of time series.

 SECTION - B

**Answer any five questions: ( 5 x 8 =40 )**

1. Explain the scope and limitation of statistics.
2. Draw a histogram and frequency polygon for the following data:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Class** | **0-10** | **10-20** | **20-30** | **30-40** | **40-50** | **50-60** | **60-70** |
| **Frequency** | **4** | **6** | **7** | **14** | **16** | **14** | **8** |

1. Find coefficient of correlation between the costs and sales for the following data:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cost** | **39** | **65** | **62** | **90** | **82** | **75** | **25** | **98** | **36** | **78** |
| **Sales** | **47** | **53** | **58** | **86** | **62** | **68** | **60** | **91** | **51** | **84** |

 14. An analysis of the weekly wages paid to workers in two firms, A and B belonging

 to the same industry give the following results.

|  |  |  |
| --- | --- | --- |
|  | **Firm A** | **Firm B** |
| **No. of wage earners** | **586** | **648** |
| **Avg. Weekly wage** | **Rs. 52.5** | **Rs. 47.5** |
| **Variance of the distribution of wage** | **100** | **121** |

Find the average weekly wage and the standard deviation of the wage of all the workers in two firms, A and B taken together.

1. Find the coefficient of skewness from the following data:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Value** | **6** | **12** | **18** | **24** | **30** | **36** | **42** |
| **Frequency** | **4** | **7** | **9** | **18** | **15** | **10** | **5** |

1. Analyse the following frequency distribution by the method of moments, find β2 and interpret your results.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **X** | **2** | **3** | **4** | **5** | **6** |
| **F** | **1** | **3** | **7** | **3** | **1** |

1. Calculate Laspeyre’s, Paashe’s, and Fisher’s index numbers for the data given below

|  |  |  |
| --- | --- | --- |
|  **Commodity** | **Base year** | **Current year** |
| **Price** | **Expenditure** | **Price** | **Expenditure** |
| **A** | **5** | **50** | **6** | **72** |
| **B** | **7** | **84** | **10** | **80** |
| **C** | **10** | **80** | **12** | **96** |
| **D** | **4** | **20** | **5** | **30** |
| **E** | **8** | **56** | **8** | **64** |

1. Solve (using graphical method)

 Max Z = 3X1 + 4 X2

Subject to the constraints 4X1 + 2X2 $\leq $ 80

 2X1 + 5X2 $\leq $ 180

 and X1, X2 $\geq $ 0.

**SECTION –C**

**Answer any TWO questions. ( 2 x 20 =40)**

1. a) From the following data, calculate mean and mode (7)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Maks** | **0 – 10** | **10 – 20** | **20 – 30** | **30 – 40** | **40 – 50** | **50 – 60** |
| **No. of students** | **10** | **20** | **30** | **50** | **40** | **30** |

 b) From the marks given below obtained by two students taking the same course,

 find out who is more consistent. (13)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **58** | **59** | **66** | **65** | **66** | **52** | **75** | **31** | **46** | **48** |
| **B** | **56** | **87** | **89** | **46** | **93** | **65** | **44** | **54** | **78** | **68** |

1. The following table represents aptitude test scores and productivity indices of 10 workers selected at random.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Aptitude test scores** | **60** | **62** | **65** | **70** | **72** | **48** | **53** | **73** | **65** | **82** |
| **Productivity indices** | **68** | **60** | **62** | **80** | **85** | **40** | **52** | **62** | **60** | **81** |

 Calculate two regression equations and estimate the productivity index of a worker

 whose test score is 92.

1. From the following data, calculate seasonal indices by Ratio to trend method.

|  |  |
| --- | --- |
| **Year**  |  **QUARTERLY SALES (Rs. Lakhs)** |
| **I** | **II** | **III** | **IV** |
| **A** | **8** | **16** | **24** | **32** |
| **B** | **48** | **36** | **24** | **12** |
| **C** | **48** | **16** | **32** | **64** |
| **D** | **72** | **108** | **144** | **36** |
| **E** | **56** | **28** | **84** | **112** |

22. Obtain an initial basic feasible solution to the following transportation problem by

 (i) North-west corner rule

 (ii) Least cost method

 (iii) Vogel’s approximation methods.

|  |  |
| --- | --- |
|  | **Destination**  |
| **origin** | **D** | **E** | **F** | **G** | **Availability** |
| **A** | **11** | **13** | **17** | **14** | **250** |
| **B** | **16** | **18** | **14** | **10** | **300** |
| **C** | **21** | **24** | **13** | **10** | **400** |
| **Requirement** | **200** | **225** | **275** | **250** |  |

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