LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.COM.** DEGREE EXAMINATION – **COMMERCE**

SECOND SEMESTER – APRIL 2011

# ST 2102/2101 - BUSINESS STATISTICS

Date : 09-04-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**SECTION - A**

**Answer all the questions:** ( 10 X 2 = 20)

1. State any two measures of dispersion
2. State the formula for computing Karl Pearson coefficient of correlation
3. State the formula for computing Spearman’s Rank correlation
4. Determine mean and median for the for the following observations 12,10,5,8,9
5. State the components of a time series
6. State the methods of estimating trend
7. The fitted regression equation is Sales=0.3+3.2Advertisement\_Expense. Determine Sales when Advertisement Expense is Rs.2,00,000
8. Define Index number
9. Current year price ( P1) = 187, base year price (P­0 ) = 167 determine the price index
10. State the methods of determining the Initial Basic Feasible Solution(IBFS) for a transportation problem

**SECTION- B**

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

11. Explain the Scope and Limitation of Statistics

1. Construct a Histogram and Frequency polygon for the data given below

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Income(in 000s)** | **0-5** | **5-10** | **10-15** | **15-20** | **20-25** | **25-30** |
| **Number of Employees** | **5** | **20** | **25** | **40** | **50** | **20** |

13. Explain the different types of bar charts with examples

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Judge I** | **1** | **5** | **4** | **8** | **9** | **6** | **10** | **7** | **3** | **2** |
| **Judge II** | **4** | **8** | **7** | **6** | **5** | **9** | **10** | **3** | **2** | **1** |

1. Determine Spearman’s Rank Correlation

1. State the differences between Correlation and Regression
2. Explain the components of Time series
3. Determine Price index number by the method of Laspere, Paasche, Bowley, and Fisher for the data given below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Commodity** | **2009** | | **2010** | |
| **Price (p0)** | **Quantity(q0)** | **Price (p1)** | **Quantity(q1)** |
| **A** | **15** | **12** | **16** | **15** |
| **B** | **12** | **8** | **10** | **10** |
| **C** | **8** | **5** | **7** | **10** |
| **D** | **10** | **15** | **15** | **20** |
| **E** | **14** | **4** | **13** | **5** |

1. The estimated time taken for each person in completing different jobs is given below. Determine the optimum solution of the assignment problem by Hungarian method

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Job** | | | |
| **Person** | **I** | **II** | **III** | **IV** |
| **A** | **14** | **5** | **8** | **7** |
| **B** | **2** | **12** | **6** | **5** |
| **C** | **7** | **8** | **3** | **9** |
| **D** | **2** | **4** | **6** | **10** |

**SECTION- C**

**Answer any two questions:** ( 2 X 20 = 40)

19. (i) Determine Mean deviation and Standard deviation for the data given below (10)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Mark(X)** | **0-10** | **10-20** | **20-30** | **30-40** | **40-50** | **50-60** |
| **Frequency(f)** | **10** | **20** | **30** | **50** | **40** | **30** |

(ii) Determine Mean , Median and Mode for the data given below (10)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Mark(X)** | **0-10** | **10-20** | **20-30** | **30-40** | **40-50** | **50-60** |
| **Frequency(f)** | **10** | **20** | **30** | **50** | **40** | **30** |

20. Data on Advertisement Expense and Sales are given below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Advertisement Expense(in lakhs) (X)** | **1** | **2** | **3** | **4** | **5** |
| **Sales(in lakhs) (Y)** | **10** | **20** | **30** | **50** | **40** |

i) Construct a Regression model of Y on X (7)

ii) Construct a Regression model of X on Y (7)

iii) Estimate Sales when Advertisement expense equal to 5.2 (3)

iv) Etimate the advertisement expense required to get a sales of 70 lakhs (3)

21. Fit a straight line and a second degree parabola for the given data and estimate sales for the

year 2011

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **2006** | **2007** | **2008** | **2009** | **2010** |
| **Sales(000s)** | **23** | **45** | **56** | **62** | **68** |

22.(i) Determine the optimum solution for the given LPP problem by Graphical method (10)

Maximize: Z = 45x1 + 55x2

Subject to: 6x1+3x2  120

4x1+10x2  180

(ii) Determine Initial Basic Feasible Solution(IBFS) for the following transportation problem

by the method of a) North west corner rule b)Vogel’s approximation method (10)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Demand** | | | |  |
| **Supply** | **D1** | **D2** | **D3** | **D4** | **AVAILABILITY** |
| **A1** | **1** | **2** | **1** | **4** | **30** |
| **A2** | **3** | **3** | **2** | **1** | **50** |
| **A3** | **4** | **2** | **5** | **9** | **20** |
| **DEMAND** | **20** | **40** | **30** | **10** | **100** |

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