

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034****B.Com. DEGREE EXAMINATION - COMMERCE**

THIRD SEMESTER – NOVEMBER 2007

**ST 3104 / 3101 - BUSINESS STATISTICS**

BB 25

Date : 02/11/2007

Dept. No. 

Max. : 100 Marks

Time : 1:00 - 4:00

**PART -A****(10 × 2 = 20 Marks)****Answer ALL questions.**

01. Write any two applications of statistics in business
02. Define dispersion and state it's significance.
03. The first four central moments of a distribution are 0, 5, 7 and 8. Comment on skewness of the distribution.
04. Write the regression coefficient formulae and give an example.
05. What is a time series? Describe any two uses of time series in business.
06. Mention any two uses of Index numbers in business.
07. Define a LPP and give an example.
08. State the limitations of Graphical method while solving an LPP.
09. Give an example for Un-Balanced Transportation problem.
10. State the uses of Scatter diagram.

**PART -B****(5 × 8 = 40 Marks)****Answer any FIVE questions.**

11. The marks secured by the students of a class are given below:

Calculate (i) Arithmetic Mean (ii) Median

<b>Marks :</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>
<b>No.of students:</b>	<b>4</b>	<b>2</b>	<b>7</b>	<b>1</b>	<b>3</b>	<b>1</b>

12. Fit a straight line trend equation by the method of least squares and estimate sales for the year 2007.

<b>Year</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
<b>Sales (in Rs.lakhs)</b>	<b>100</b>	<b>120</b>	<b>140</b>	<b>160</b>	<b>180</b>

13. For a group of 50 male workers, the mean and the standard deviation of their daily wages are Rs.60 and Rs.10 respectively. For a group of 40 female workers these are Rs.50 and Rs.9 respectively.

Find the mean and standard deviation for the combined group of 90 workers.

14. Calculate Spearman's coefficient of Rank correlation between marks assigned to ten students by judges A and B in a certain competitive test given below:

<b>Marks by judgeA:</b>	<b>62</b>	<b>54</b>	<b>44</b>	<b>60</b>	<b>45</b>	<b>44</b>	<b>37</b>	<b>38</b>	<b>25</b>	<b>27</b>
<b>Marks by judgeB:</b>	<b>65</b>	<b>69</b>	<b>43</b>	<b>38</b>	<b>77</b>	<b>48</b>	<b>35</b>	<b>30</b>	<b>25</b>	<b>50</b>

15. Solve the following LPP by Graphical method

**Max  $z = x+2y$**

**Subject to the constraints that:**

**$-x+2y \leq 8$**

**$x+2y \leq 12$**

**$x-2y \leq 3,$**

**$x, y \geq 0$**

16. Calculate a suitable weighted price index from the following data:

<b>Material required</b>	<b>Unit</b>	<b>Quantity Required</b>	<b>Price during</b>	
			<b>Base year</b>	<b>Current year</b>
			<b>(Rs.)</b>	<b>(Rs.)</b>
Cement	50 lb	500 lb	5.0	8.0
Timber	c.ft.	1,000 c.ft.	9.5	14.2
Steel Sheet	cwt.	50 cwt.	34.0	42.0
Bricks	per'1000	20,000	12.0	24.0

17. Compute quartile deviation from the following data

<b>Size</b>	<b>5 -7</b>	<b>8 -10</b>	<b>11 -13</b>	<b>14 -16</b>	<b>17 -18</b>
<b>Frequency</b>	<b>14</b>	<b>24</b>	<b>38</b>	<b>20</b>	<b>4</b>

18. Distinguish between correlation and Regression.

**PART C**

**Answer any TWO questions**

**(2x20=40)**

19. The Experience (in years), X and Sales turnover (in Crore Rs.), Y were collected from 10 Senior Managers' record of a firm and are given below.

- [a] Draw a scatter diagram for the given data and give your comments.
- [b] Determine the co-efficient of Correlation between Experience and Sales turnover.
- [c] Estimate Sales Turnover when the experience is 13 years.
- [d] Compute  $r^2$  and comment

<b>Experience (in years)</b>	<b>5</b>	<b>7</b>	<b>5</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>15</b>
<b>Sales Turnover (in crore Rs.)</b>	<b>41</b>	<b>55</b>	<b>41</b>	<b>50</b>	<b>32</b>	<b>42</b>	<b>35</b>	<b>25</b>	<b>31</b>	<b>23</b>

- 20. [a] Explain any FOUR types of classification of data by giving suitable examples
- [b] In a certain experiment to compare the weight increase contributed by two brands of Cereal foods A and B, the following results of increase in weights(Kg) were observed from 8 babies of two independent groups:

<b>Baby number</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<b>Increase in Weight</b>	<b>Food A</b>	<b>4.9</b>	<b>5.3</b>	<b>5.1</b>	<b>5.2</b>	<b>4.7</b>	<b>5.0</b>	<b>5.2</b>	<b>5.3</b>
	<b>Food B</b>	<b>5.2</b>	<b>5.5</b>	<b>5.2</b>	<b>5.3</b>	<b>5.0</b>	<b>5.4</b>	<b>5.4</b>	<b>5.3</b>

- Find [i] Which brand of Cereal food is better with regard to weight increase.
- [ii] Which brand of Cereal food is consistent with regard to weight increase.

21. Solve the following LPP by BigM-method.

$$\begin{aligned} \text{Max: } z &= 6x_1 + 3x_2 \\ 3x_1 + 6x_2 &\leq 180 \\ 4x_1 + 3x_2 &\geq 120 \\ x_1 + 2x_2 &\leq 90 \\ x_1, x_2 &\geq 0 \end{aligned}$$

22. a) Find the seasonal variations by the Ratio-to-Moving average method to the following data:

<b>YEAR</b>	<b>Quarter1</b>	<b>Quarter2</b>	<b>Quarter3</b>	<b>Quarter4</b>
<b>1972</b>	<b>34</b>	<b>22</b>	<b>55</b>	<b>65</b>
<b>1973</b>	<b>45</b>	<b>43</b>	<b>62</b>	<b>80</b>
<b>1974</b>	<b>44</b>	<b>45</b>	<b>69</b>	<b>92</b>
<b>1975</b>	<b>55</b>	<b>59</b>	<b>70</b>	<b>99</b>
<b>1976</b>	<b>60</b>	<b>72</b>	<b>86</b>	<b>110</b>

[b] The table below relates to the daily pay of the wage earners on a Company's pay roll:

	<b>April 2000</b>		<b>April 2005</b>	
	<b>Number</b>	<b>Total pay (Rs)</b>	<b>Number</b>	<b>Total pay (Rs.)</b>
Men aged 21 and over	350	50000	300	70000
Women aged 18 and over	400	16000	1200	80000
Youths and boys	150	45000	100	56000
Girls	100	12500	400	40000

Construct the following price index numbers of daily earnings based on 2000 as base year: [i]. Laspeyre's [ii]. Paasche's [iii]. Marshall-Edgeworth [iv]. Fisher's Ideal index.

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