STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 86
(For candidates admitted from the academic year 2023 – 2024 and thereafter)

B. COM. DEGREE EXAMINATION - NOVEMBER 2024
HONOURS
FIRST SEMESTER

COURSE : MAJOR CORE
PAPER : STATISTICS FOR BUSINESS
COURSE CODE : 23BH/MC/SB14
TIME : 3 HOURS **MAX. MARKS: 100**

Q. No.	**SECTION A** **Answer all questions: (5 x 2 =10)**	CO	KL
1	What are the components of time series?	1	1
2	Outline the uses of chi square test.	1	1
3	Determine the median from the data given below: Income (Rs.) 1200 1800 5000 2500 3000 1600 3500 No. of persons 12 16 2 10 3 15 7	1	1
4	Calculate $r_{12.3}$ using the following zero order correlation coefficients: $r_{12} = 0.5$, $r_{13} = 0.4$, $r_{23} = 0.6$	1	1
5	Given the following equation: $Y = 45 + 2.6X$ (Origin 2015, X unit = 1 year, Y unit = Annual Production of sugar) Shift the origin to 2018.	1	1
Q. No.	**SECTION B** **Answer any 4 questions: (4 x 5 = 20)**	**CO**	**KL**
6	Explain the properties of regression coefficients.	2	2
7	Fit a linear trend equation in the following data: Year 2019 2020 2021 2022 2023 Sales 100 120 140 160 180 (in lakhs Rs.)	2	2
8	Find the mean of the following data: Class Interval 50-59 40-49 30-39 20-29 10-19 0-9 Frequency 1 3 8 10 15 3	2	2
9	If n = 100, $\bar{X} = 1570$ & $\sigma = 120$, determine Standard Error.	2	2
10	Determine the trend using 5 yearly moving averages for the following data: Year 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 Production 21 22 23 25 24 22 25 26 27 26 (in '000 tonnes)	2	2
11	Plot the following data on a graph and ascertain trend by the freehand method: Year 2014 2015 2016 2017 2018 2019 Production 100 120 95 105 108 102 (million tons)	2	2

…2

Q. No.	SECTION C Answer the following questions: (4 x 10 =40)	CO	KL
12 a.	Compute Karl Pearson's coefficient of correlation from the following data, using 20 as the working mean for price and 70 as the working mean for demand: Price: 14 16 17 18 19 20 21 22 23 Demand: 84 78 70 75 66 67 62 58 60	3	3
	(or)		
12 b.	Obtain the line of regression of Y on X for the following data: Age (yrs.) X: 66 38 56 42 72 36 63 47 55 45 Blood Pressure (Y): 145 124 147 125 160 118 149 128 150 124 Estimate the blood pressure of a man whose age is 50 years.	3	3
13 a.	Prices of shares of a company on the different days in a month were found to be 66, 65, 69, 70, 69, 71, 70, 63, 64, 68 Discuss whether the mean price of the shares in the month is 65.	3	3
	(or)		
13 b.	The productivity levels of a worker before and after a strike are believed to be dependent events. The weekly outputs of 10 workers before and after a strike are listed below. Test the null hypothesis that productivity remains unchanged against the alternative that it has increased at 5% level of significance: Worker 1 2 3 4 5 6 7 8 9 10 Output before strike 85 90 88 79 95 86 89 85 91 84 Output after strike 91 91 87 88 98 94 93 80 90 90	3	3
14 a.	Intelligence tests on two groups – one group consisting of 121 girls and the other group consisting of 81 boys gave the following results: Group of girls: Mean = 84, SD = 10 Group of boys: Mean = 81, SD = 12 Examine if the difference is significant.	4	4
	(or)		
14 b.	The number of road accidents per week in a certain area were as follows: 12 8 20 2 14 10 15 6 9 4 Are these frequencies in agreement with the belief that accident conditions were the same during the 10 week period?	4	4
15 a.	Calculate trend by four-yearly moving averages for the data given below: Year 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 Production 614 615 652 678 681 655 717 719 708 779 757	4	4
	(or)		
15 b.	Random samples are drawn from two populations and the following results were obtained: Sample X: 16 17 18 19 20 21 22 24 26 27 Sample Y: 19 22 23 25 26 28 29 30 31 32 35 36 Find the variance of two populations and test whether the two samples have same variance.	4	4

<table>
<tr><th>Q. No.</th><th>SECTION D
Answer any one question: (1 x 15 = 15)</th><th>CO</th><th>KL</th></tr>
<tr><td>16</td><td>A coffee company appoints four salesmen P,Q,R and S; and observes their sales in three districts A, B and C. The figures are given below (in lakhs of rupees):
<table>
<tr><th rowspan="2">District</th><th colspan="4">Salesmen</th></tr>
<tr><th>P</th><th>Q</th><th>R</th><th>S</th></tr>
<tr><td>A</td><td>36</td><td>36</td><td>21</td><td>35</td></tr>
<tr><td>B</td><td>28</td><td>29</td><td>31</td><td>32</td></tr>
<tr><td>C</td><td>26</td><td>28</td><td>29</td><td>29</td></tr>
</table>
Carry out an analysis of variance.</td><td>5</td><td>5</td></tr>
<tr><td>17</td><td>Determine the seasonal indices for the various quarters from the given data:
<table>
<tr><th>Year</th><th>Quarter I</th><th>Quarter II</th><th>Quarter III</th><th>Quarter IV</th></tr>
<tr><td>2015</td><td>3.7</td><td>4.1</td><td>3.3</td><td>3.5</td></tr>
<tr><td>2016</td><td>3.7</td><td>3.9</td><td>3.6</td><td>3.6</td></tr>
<tr><td>2017</td><td>4.0</td><td>4.1</td><td>3.3</td><td>3.1</td></tr>
<tr><td>2018</td><td>3.3</td><td>4.4</td><td>4.0</td><td>4.0</td></tr>
</table></td><td>5</td><td>5</td></tr>
<tr><th>Q. No.</th><th>SECTION E
Compulsory Case Study: (1 x 15 = 15)</th><th>CO</th><th>KL</th></tr>
<tr><td>18</td><td>Out of 8000 graduates in a town, 800 are female, out of 1600 graduate employees 120 are female. Use χ^2 to determine if any distinction is made in appointment on the basis of sex.</td><td>6</td><td>6</td></tr>
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