STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2023-24 and thereafter)

B.Com. DEGREE EXAMINATION NOVEMBER 2024
ACCOUNTING & FINANCE
FIRST SEMESTER

COURSE : ALLIED CORE
PAPER : STATISTICS FOR BUSINESS DECISIONS
SUBJECT CODE : 23AF/AC/SB15
TIME : 3 HOURS MAX. MARKS: 100

<table>
<tr><th>Q. No.</th><th>SECTION A (5 x 2 = 10 marks)
Answer all questions:</th><th>CO</th><th>KL</th></tr>
<tr><td>1.</td><td>What is test of goodness of fit?</td><td>1</td><td>1</td></tr>
<tr><td>2.</td><td>A sample of 1600 is taken from the universe of fathers and sons. The sample study gives the connection between the two to be 0.80. Within what limits does it hold true for the universe?</td><td>1</td><td>1</td></tr>
<tr><td>3.</td><td>List down any two Significance of Correlation.</td><td>1</td><td>1</td></tr>
<tr><td>4.</td><td>The arithmetic mean of a sample X is 20, the regression value being (r=0.6), standard deviation of X being 18, standard deviation of Y being 170, arithmetic mean of Y is 200. Derive the regression equation X on Y.</td><td>1</td><td>1</td></tr>
<tr><td>5.</td><td>The sales of a commodity in tonnes varied from January 2020 to December 2020 as follows
280 280 280 280 270 240
230 230 220 200 210 200
Fit a trend line by the method of semi-average</td><td>1</td><td>1</td></tr>
<tr><th>Q. No.</th><th>SECTION B (4 x 5 = 20 marks)
Answer any four questions:</th><th>CO</th><th>KL</th></tr>
<tr><td>6.</td><td>Calculate Karl Pearson’s co-efficient of correlation from the following data:
<table>
<tr><td>Roll No. Of Students</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>Marks in English</td><td>48</td><td>35</td><td>17</td><td>23</td><td>47</td></tr>
<tr><td>Marks in Mathematics</td><td>45</td><td>20</td><td>40</td><td>25</td><td>45</td></tr>
</table></td><td>2</td><td>2</td></tr>
<tr><td>7.</td><td>A Wholesaler in apples claims that only 4% of the apples supplied by him are defective. A random sample of 600 apples contained 36 defective apples. Test the claim of the wholesaler.</td><td>2</td><td>2</td></tr>
<tr><td>8.</td><td>Explain Mc Nemar Test with suitable examples highlighting the importance of the test in statistics.</td><td>2</td><td>2</td></tr>
<tr><td>9.</td><td>The following data based on 450 students are given for marks in Statistics and Economics at a certain examination
<table>
<tr><td>Mean marks in Statistics</td><td>40</td></tr>
<tr><td>Mean marks in Economics</td><td>48</td></tr>
<tr><td>Standard Deviation of marks in Statistics</td><td>12</td></tr>
<tr><td>Variance of marks in Economics</td><td>256</td></tr>
</table>
Sum of the product of deviation of marks from their respective mean is 42075. Give the equation of the two lines of regression and estimate the average marks in Economics of candidates who obtained 50 marks in Statistics.</td><td>2</td><td>2</td></tr>
</table>

…2

10. Fit a trend line to the following data by the method of Semi Averages — 2 — 2

Year	2018	2019	2020	2021	2022	2023	2024
Sales of Firm A (1000 units)	102	105	114	110	108	116	112

11. A set of 5 coins is tossed 3200 times and the no. of heads appearing each time is noted. The results are given below — 2 — 2

No. of Heads	0	1	2	3	4	5
Freq.	80	570	1100	900	50	50

Test the hypothesis that the coins are unbiased

Q. No.	SECTION C (4 x 10 = 40 marks) Answer the following:	CO	KL

12. a. A treatment was given runners experiencing joint paint and the same runners were asked whether the experienced joint paint even after the treatment — 3 — 3

	Joint paint after treatment	
Before	No	Yes
No	79	26
Yes	67	33

Using Mc nemar test whether the treatment works to change the opinion of people from Yes to No

(OR)

b. The following zero-order correlation coeffecients are given: r_{12} =0.98, r_{13}=0.44 and r_{23}= 0.54
Calculate multiple correlation coefficient treating first variable as dependent and second and third variable as independent.

13. a. Two random samples are drawn from two normal population and their values are given below — 3 — 3

A	66	67	75	76	82	84	88	90	92	-	-
B	64	66	74	78	82	85	87	92	93	95	97

Test whether the two population have the same variance.

(OR)

b. Calculate the standard error of mean from the following data showing the amount paid by 100 firms in Calcutta.

Mid value (Rs)	39	49	59	69	79	89	99
No of firms	2	3	11	20	32	25	7

14. a. Based on the information on 1000 randomly selected fields about the tenancy status of cultivation and use of fertilizers the following classification was noted — 4 — 4

	Owned	Rented	Total
Fertilizers	416	184	600
No Fertilizers	64	336	400
Total	480	520	1000

Would you conclude that owner cultivators are more inclined towards fertilizer usage at 5% level? Test the hypothesis using Chi Square

(OR)

b. Calculate seasonal indices by the ratio to moving average method from the following data

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2021	68	62	61	63
2022	65	58	66	61
2023	68	63	63	67

15. a. Given below is the following data — 4 — 4

	X	Y
Arithmetic Mean	36	85
Standard Deviation	11	8

Correlation of Coefficient between X and Y = 0.66

(i) Find the two Regression Equation

(ii) Estimate the value of X when Y = 75

(OR)

b. The ranking of 10 students in two subjects are given

A	6	5	3	10	2	4	9	7	8	1
B	3	8	4	9	1	6	10	7	5	2

Calculate Karl Pearson Correlation Coefficient

Q. No.	**SECTION D (2 x 15 = 30 marks)** **Answer any two questions:**	**CO**	**KL**

16. Calculate the trend value by the method of Least Squares for the following data. — 5 — 5

Year	2018	2019	2020	2021	2022	2023	2024
Value	75	67	68	65	50	54	41

17. A test was conducted for 3 detergents and 3 different water temperatures. The following reading were obtained after coding of data. — 5 — 5

Water Temperature	A	B	C
Cold Water	7	5	17
Warm Water	-1	2	18
Hot Water	4	-4	8

Perform a two way analysis of variance using 5% significance.

18. The lifetime of electric bulbs for a random sample of 10 from a large assignment gives the following data — 5 — 5

Items	1	2	3	4	5	6	7	8	9	10
Life in ('000hr)	4.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.4	5.6

Can we accept the hypothesis that the average lifetime of bulbs is 4000 hrs?

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