

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086
(For Candidates admitted during the academic year 2023 – 2024 & thereafter)

B.A. DEGREE EXAMINATION, NOVEMBER 2024
BRANCH IV – ECONOMICS
FIRST SEMESTER

COURSE : ALLIED - CORE

PAPER : STATISTICS FOR ECONOMICS

SUBJECT CODE : 23EC/AC/SE15

TIME : 3 HOURS

MAX. MARKS: 100

Q. No.	SECTION A Part A	CO	KL
	ANSWER ALL QUESTIONS IN 50 WORDS EACH (10 x 2 = 20)		
1	Specify the regression equation of Y on X. What does it mean?	1	K1
2	What is correlation used for?	1	K1
3	State the Principle of Least Squares.	1	K1
4	Define Probability.	1	K1
5	What is hypothesis? State a null hypothesis.	1	K1
6	What is the use of standard error?	1	K1
7	Give an example of time series data.	1	K1
8	Diagrammatically represent the relationship if the estimated correlation coefficients are as follows: $r = +1$, $r = -1$, $r = 0$.	1	K1
9	Is b_{xy} equal to b_{yx} ? Why?	1	K1
10	Define Random Variables.	1	K1
	Part B		
	ANSWER ANY TEN OUT OF TWELVE QUESTION IN 50 WORDS EACH (10 x 2 = 20)	CO	K2
11	How is Consumption and Income related?	2	K2
12	With the help of a diagram show how demand and price are related?	2	K2
13	List any four properties of a normal distribution.	2	K2
14	Find the area under the normal curve for $z=1.54$	2	K2
15	What is Type II error?	2	K2
16	Given that Sample Mean = 53, Population Mean = 56, $n=16$ and $S=3$; is there a significant difference between the population and sample mean?	2	K2
17	$Q=a-bP$ is the demand function. How is elasticity calculated?	2	K2
18	In the demand function: $Q=a-bP$; why is the slope coefficient negative?	2	K2
19	What is a small sample test?	2	K2
20	What are the components of time series data?	2	K2
21	What is conditional probability?	2	K2

22	State the addition theorem.	2	K2																				
Q. No.	SECTION B Part A ANSWER ANY FOUR OUT OF SIX QUESTIONS IN 250 WORDS EACH (4x5 = 20)	C O	KL K3																				
23	Calculate the coefficient of correlation: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Sales (in crores)</td> <td>14</td> <td>16</td> <td>18</td> <td>20</td> <td>24</td> <td>30</td> <td>32</td> </tr> <tr> <td>Advt (in lakhs)</td> <td>52</td> <td>62</td> <td>65</td> <td>70</td> <td>76</td> <td>80</td> <td>78</td> </tr> </table>	Sales (in crores)	14	16	18	20	24	30	32	Advt (in lakhs)	52	62	65	70	76	80	78	3	K3				
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24	A sample of 100 Households in a village was selected and their average income per month was observed to be Rs.628 with a standard deviation in the monthly income to be Rs.50. Find the standard error of the mean and construct 99% Confidence Interval for the income.	3	K3																				
25	Explain different types of correlation with examples.	3	K3																				
26	Is there a significant difference in the average marks? X ₁ : 18 20 36 50 49 36 34 49 41 X ₂ : 29 28 26 35 30 44 46	3	K3																				
27	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Sales (in crores)</td> <td>14</td> <td>16</td> <td>18</td> <td>20</td> <td>24</td> <td>30</td> <td>32</td> </tr> <tr> <td>Advt (in lakhs)</td> <td>52</td> <td>62</td> <td>65</td> <td>70</td> <td>76</td> <td>80</td> <td>78</td> </tr> </table> Fit a relevant regression model.	Sales (in crores)	14	16	18	20	24	30	32	Advt (in lakhs)	52	62	65	70	76	80	78	3	K3				
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Advt (in lakhs)	52	62	65	70	76	80	78																
28	A bag contains 5 White and 3 Black Balls. Two balls are drawn at random one after the other without replacement. Find the probability that the two balls drawn are black.	3	K3																				
	Part – B ANSWER ANY FOUR OUT OF SIX QUESTIONS IN 250 WORDS EACH (4x5 = 20)		K4																				
29	Eight coins are tossed at a time 256 times. Number of heads observed at each throw is recorded and the results are given below. Find the expected frequencies. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>No. of heads at a throw</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>Frequency</td> <td>2</td> <td>6</td> <td>30</td> <td>52</td> <td>67</td> <td>56</td> <td>32</td> <td>10</td> <td>1</td> </tr> </table>	No. of heads at a throw	0	1	2	3	4	5	6	7	8	Frequency	2	6	30	52	67	56	32	10	1	4	K4
No. of heads at a throw	0	1	2	3	4	5	6	7	8														
Frequency	2	6	30	52	67	56	32	10	1														
30	(i) State the multiplication theorem. (ii) One card is drawn from a pack of 52 cards. What is the probability that it is either a King or a Queen? (iii) Calculate the probability of picking a card that has a heart or a spade.	4	K4																				
31	Explain the different components of time series.	4	K4																				

32	The income of a group of 10000 individuals was found to be normally distributed with mean income =Rs.750 per month with a standard deviation of Rs.50 per month. Validate that about 95% of these individuals had income exceeding Rs.668 and only 5% had income exceeding Rs.832.	4	K4
33	List the properties of correlation and regression coefficients.	4	K4
34	Four plants – 1, 2, 3 and 4 are used to produce units of a product. The first plant produces 30% of the units of the product. The second, third and fourth plants produce 25%, 40% and 5% respectively. A unit of the product produced by these plants is found to be defective. What is the probability that this defective product is produced by Plant 1,2,3 and 4 given that $P(B/A_1)=0.05$, $P(B/A_2)=0.10$, $P(B/A_3)=0.15$ and $P(B/A_4)=0.02$	4	K4
Q. No.	SECTION C ANSWER ANY TWO OUT OF FOUR QUESTIONS IN ABOUT 600 WORDS EACH. (2x 10 =20)	CO	KL K5
35	Explain the conventional procedure of testing a hypothesis.	5	K5
36	A company makes three types of high performance CRTs. A random sample of CRTs are drawn and their lifetime in hours is recorded below. Is there a difference in the average lifetime of the three different types of CRTs at $\alpha= 1\%$? Type A: 407 411 409 Type B: 404 406 408 405 402 Type C: 410 408 406 408	5	K5
37	C: 70 65 90 95 110 115 120 140 155 150 (Consumption) Y: 80 100 120 140 160 180 200 220 24 260 (Income) Estimate the model $C = a + bY$ and Interpret.	5	K5
38	Year: 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 Prod: 21 22 23 25 24 22 25 26 27 26 (in '000 tonnes) Compute the trend values for production using a three yearly moving average method.	5	K5
