Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 27-05-2025 **Time:** 01:00 pm – 04:00 pm

School: SOIS	**Program:** BCA	
Course Code : MAT1006	**Course Name:** Statistical Methods and Techniques	
Semester: II	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**
Marks	**14%**	**24%**	**31%**	**31%**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Any two scope of Statistics.	**2 Marks**	**L1**	**CO1**
2.	Make the following inclusive classes into exclusive classes 10-19, 20-29, 30-39, 40-49, 50-59, 60-69.	**2 Marks**	**L1**	**CO1**
3.	Two data sets A and B have standard deviations 12 and 13 units respectively. Idenfity their variances.	**2 Marks**	**L1**	**CO2**
4.	Write the formula of r-th moments of X about mean.	**2 Marks**	**L1**	**CO2**
5.	Write the formula of Spearman's rank correlation coefficient.	**2 Marks**	**L1**	**CO3**
6.	Find the level of correlation when the range the correlation coefficients are 0.60 to 0.79 and -0.59 to -0.40.	**2 Marks**	**L1**	**CO3**
7.	What is the value of the correlation coefficient if the two regression coefficients are 0.25 and 1.2?	**2 Marks**	**L1**	**CO3**
8.	Write the sample space for tossing three coins.	**2 Marks**	**L1**	**CO4**
9.	The probabilities of two independent events A and B are 2/3 and 1/3. Find $P(A \cap B)$.	**2 Marks**	**L1**	**CO4**
10.	Write the formula of the conditional probabilities.	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11. a. Consider the following distribution data table. Draw more-than cumulative frequency curve and less than cumulative frequency curve. Also locate the median using your ogive. **10 Marks** **L2** **CO 1**

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	3	8	17	29	15	6	2

Or

12. a. Draw the percentage bar diagram of the following data set : **10 Marks** **L2** **CO 1**

ITEMS OF EXPENDITURE	Food	Clothing	Education	Miscellaneous	Saving or Deficit
FAMILY A (INCOME RS. 500)	150	125	25	190	10
FAMILY B (INCOME RS. 300)	150	60	50	70	-30

13. a. **Consider the following data set: 10, 12, 5, 9, 8, 4, 8, 6, 7, 2. Determine the lower quartile, median and the upper quartile.** **10 Marks** **L3** **CO 2**

Or

14. a. Consider the marks scored in MAT1006 by 10 students, each from two different sections, out of a total mark of 50 in Midterm examinations. **10 Marks** **L3** **CO 2**

Section A	40	30	28	10	2	48	21	15	50	20
Section B	28	32	25	49	20	24	30	26	22	25

Determine:

(i) Which section students are better scorers?

(ii) Which section students are more consistent performers?

15.	**a.**	Calculate Karl Pearson's Coefficient of Skewnee from the data given below :	**10 Marks**	**L2**	**CO 2**

Marks group	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	12	16	26	38	22	15	7	4

Or

16.	**a.**	The first four moments of a distribution about the value 5 of the variable are 2, 20, 40, and 50. Show that the mean is 7. Also find the other moments, β_1 and β_2 , and comment upon the nature of the distribution and kurtosis.	**10 Marks**	**L2**	**CO 2**

17.	**a.**	Consider the equation 3x-2y+11=0. Find the two regression coefficients and the correlation coefficient.	**5 Marks**	**L2**	**CO 3**
	b.	Three coins are tossed. What is the probability of getting *(i) all heads* *(ii) at least one head* (iii) exactly one head or two heads	**10 Marks**	**L3**	**CO 4**

Or

18.	**a.**	Rankings of 10 trainees at the beginning (x) and at the end (y) of a certain course are given bellows:	**5 Marks**	**L2**	**CO 3**

Trainees	A	B	C	D	E	F	G	H	I	J
x	1	6	3	9	5	2	7	10	8	4
y	6	8	3	7	2	1	5	9	4	10

Calculate Spearman's rank correlation coefficient.

	b.	Two dice are thrown simultaneously. Find the probability of getting: (i) The same number on both dice, (ii) An even number as the sum (iii) A total of at least 10.	**10 Marks**	**L3**	**CO 4**

19.	**a.**	For married couples living in a certain suburb, the probability that the husband will vote on a bond referendum is 0.21, the probability that the wife will vote on the referendum is 0.28, and the probability that both will vote is 0.15. What is the probability that (i) at least one member of a married couple will vote?	**15 Marks**	**L3**	**CO 4**

		(ii) a wife will vote, given that her husband has voted? (iii) a husband will vote, given that his wife has voted?			
		Or			
20.	**a.**	Police plan to enforce speed limits by using radar traps at 3 different locations within the city limits. The radar traps at each of the locations P, Q and R are operated 40%, 30% and 30% of the time. A person who is speeding on her way to work has probabilities of 0.2, 0.1 and 0.5 respectively, of passing through these locations. If the person received a speeding ticket on her way to work, what is the probability that she passed through the radar trap located at (i) location P (ii) location Q (iii) location R?	**15 Marks**	**L3**	**CO 4**

21.	**a.**	Consider the marks of English and Mathematics as follows: English: 18, 17, 23, 22, 21, 20, 19, 19, 20, 21 Mathematics: 16, 12, 20, 15, 22, 15, 11, 14, 19, 16 Construct suitable mathematical models to estimate: (i) Marks in English when marks in Mathematics is known (ii) Marks in Mathematics when marks in English is known (iii) Estimate the mark of Mathematics when mark of English = 30	**20 Marks**	**L3**	**CO 3**
		Or			
22.	**a.**	The following are the marks obtained by a group of students in two papers. Calculate Spearman's rank correlation coefficient Economics: 78, 36, 98, 25, 75, 82, 92, 62, 65, 39 Statistics: 84, 51, 91, 69, 68, 62, 86, 58, 35, 49	**10 Marks**	**L 3**	**CO 3**
	b.	Find the Karl Pearson's coefficient of correlation between the heights of brothers and sisters from the following data : Hence interpret the nature of correlation prevalent Heights of brothers(in cm): 65, 66, 67, 68, 69, 70, 71 Heights of sisters (in cm): 67, 68, 66, 69, 72, 72, 69	**10 Marks**	**L 3**	**CO**