POORNIMA UNIVERSITY, JAIPUR

END SEMESTER EXAMINATION, 2023-2024 EVEN SEMESTER

Write Roll No Below: _____

BCA (All) I () - II (Main/Back) End Semester Examination,

23BCACSA2101: Basic of Mathematics

Time: 3 Hours **Total Marks:** 60 **Min. Passing Marks:** 21/24/27 **Question Paper ID:** 001092

Instructions: Attempt all five questions. There is an internal choice either (a or b) in Q1 to Q5. Marks of each question or its parts are indicated against each question/part. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Bloom Level(BL): 1-Remembering, 2-Understanding, 3-Applying, 4-Analysing, 5-Evaluating, 6-Creating

Use of following supporting material is permitted during examination for this subject: Nil

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Q1. (a) Find the Mean, Median and Mode from the following data

Marks BL CO: 12 3 1

x	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f	3	5	8	7	15	12	9	6	1

(OR)

(b) Find the standard and Mean deviation of the following data

x	85-89	80-84	75-79	70-74	65-69	60-64	55-59	50-54
f	1	1	2	3	9	8	2	1

Q2. (a) Find both regression lines for the following data and also calculate correlation coefficient.

Marks BL CO: 12 4 2

X	100	200	300	400	500	600	700
Y	30	50	60	80	100	110	130

(OR)

(b) Find the coefficient of correlation of the following data

x	9	8	7	6	5	4	3	2	1
f	15	16	14	13	11	12	10	8	9

Q3. (a) If $A = \begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ than find $((AB)^{-I}$

Marks BL CO: 12 1 3

(OR)

(b) If A = $\begin{bmatrix} 1 & 2 & 3 \\ 3 & -2 & 1 \\ 4 & 2 & 1 \end{bmatrix}$ then show that $A^3 - 23A - 40I = 0$

Q4. (a) Using Newton Gregory formula to find the value of y(8) from the following table:

X 0 5 10 15 20 25 30

Y 8 10 13 16 18 22 29

Marks BL CO: 12 4 4

(OR)

(b) Using Newton divided difference formula for interpolation, find **f (17)**

X	9	11	13	14	16
Y	-5	10	**18**	22	**58**

Q5. (a) (i) Evaluate $\int_0^6 \frac{dx}{(1+x^2)}$ by using Simpson's 1/3rd and 3/8th formula, where h = 1

Marks BL CO: 12 5 5

(ii) Evaluate $\int_{-1.4}^{1} e^x \, dx$ by Trapezoidal method, taking h = 0.4

(OR)

(b) Using Runge-Kutta method, find approximate value of y for x = 0.2 & x = 0.4 if $\frac{dy}{dx} = x + y^2$ given that y(0) = 1.

*****End of Question Paper*****