JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2023

M.Sc-I Semester (BT/MB)

COURSE CODE (CREDITS):20MS1MA111(02) MAX. MARKS: 35

COURSE NAME: Basics of Mathematics and Statistics

COURSE INSTRUCTOR: Dr.Neel Kanth MAX. TIME: 2 Hours

Note: (a)All questions are compulsory.

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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Q1.Let $A = \begin{bmatrix} 1 & -2 & 3 \\ 3 & 2 & -1 \end{bmatrix}, B = \begin{bmatrix} 2 & 3 \\ -1 & 2 \\ 4 & -5 \end{bmatrix}$, Find AB *and* BA and show that $AB \neq BA$ [4]

Q2.Solve the system of linear equations using Cramer's rule

$5x - 7y + z = 11, 6x - 8y - z = 15$ *and* $3x + 2y - 6z = 7$ [5]

Q3.If $\vec{a} = \hat{\imath} + \hat{\jmath} + 2\hat{k}$ and $\vec{b} = 3\hat{\imath} + 2\hat{\jmath} - \hat{k}$, Find $(\vec{a} + 3\vec{b}).(2\vec{a} - \vec{b})$ [2]

Q4.Simplify $\left(\frac{2+3i}{3+4i}\right)\left(\frac{2-3i}{3-4i}\right)$ [2]

Q5.Evaluate $\int \frac{dx}{(x+1)(x-3)}$ [3]

Q6.Find $\frac{d}{dx}\left[\frac{x^2-x}{x+1}\right]$ [3]

Q7.(a) Dirrentiate between J shaped and S speed curves of population dynamics. [3]

(b) What is isometric and allometric growth of an organism? Represent allometric growth mathematically [3]

(c) What is CRN? Explain by taking suitable example. [2]

Q8.Calculate the arithmetic mean for the following data [4]

No of tablet	4-8	8-12	12-16	16-20	20-24	24-28	28-32	32-36	36-40
No of person cured	11	13	16	14	10	9	17	6	4

Q9.Calculate the Karl Pearson coefficient of correlation between x *and* y for the following data

x	65	66	67	67	68	69	70	72
y	67	68	65	68	72	72	69	71

[4]