JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

M.Sc.-I Semester (BT/BI)

COURSE CODE (CREDITS):20MS1MA111 (2) MAX. MARKS: 25

COURSE NAME: Basics of Mathematics & Statistics

COURSE INSTRUCTORS: P K Pandey MAX. TIME: 1 Hour 30 Minutes

Note: *(a) All questions are compulsory.*

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

Q. No.	Question	Marks
Q1	Compute AA^T for the matrix $A = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 3 & -2 \\ 4 & 0 & -3 \end{bmatrix}$.	3
Q2	Given that $\cos\theta = \frac{\sqrt{3}}{2}$. Using Pythagoras theorem (in a right angle triangle) find values of $\sin\theta$ and $\tan\theta$.	3
Q3	Evaluate $\lim_{x\to -5}\left(\frac{x^2-25}{x+5}\right)$.	3
Q4	Compute $\frac{df}{dx}$ for $f(x) = \frac{(x^2+1)}{(3x-1)}$.	3.5
Q5	Evaluate $\int_{-1}^{2}(5x^3 - 4x^2 + 3x + 2)dx$	3
Q6	For $\vec{a} = 3i + 2j - k$ and $\vec{b} = i - j + 2k$ find the dot product of vectors $(\vec{a} + \vec{b})$ and $(\vec{a} - \vec{b})$.	3
Q7	Express the complex number $\frac{3+2i}{2-i}$ in form of $a + ib$ and compute $\left\|\frac{4-2i}{2+i}\right\|$.	3.5
Q8	Find the sum of (infinite) geometric sequence $18, 12, 8, \cdots$	3

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