JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Supplementary Examination- 2026

M.Sc I Semester (BT/MB)

COURSE CODE(CREDITS):20MS1MA111   MAX. MARKS: 75

COURSE NAME: Basics of Mathematics and Statistics

COURSE INSTRUCTORS:NKT   MAX. TIME: 2 Hours

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	If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, show that $A^2 - 4A - 5I = 0$	7.5
Q2	Find the value of x such that $\begin{bmatrix} 1 & x & 1 \end{bmatrix} \begin{bmatrix} 1 & 3 & 2 \\ 2 & 5 & 1 \\ 15 & 3 & 2 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix} = 0$	7.5
Q3	Show that $\begin{vmatrix} x+y & x & x \\ 5x+4y & 4x & 2x \\ 10x+8y & 8x & 3x \end{vmatrix} = x^3$	7.5
Q4	Simplify $\left(\frac{1}{1-2i} + \frac{3}{1+i}\right)\left(\frac{3+4i}{2-4i}\right)$	7.5
Q5	Find the real value of x and y if $(3x - 2i\,y)(2 + i)^2 = 10(1 + i)$	7.5
Q6	Find $\frac{d}{dx}\left(\frac{e^x + e^{-x}}{e^x - e^{-x}}\right)$	7.5
Q7	Evaluate $\int \frac{dx}{(x+1)(x+2)}$	7.5
Q8	Define Mathematical modeling	7.5
Q9	The consumption of printing papers reams for the first 11 months of a computer operator is given as 20,25,30,15,17,3526,18,40,45,50 Find the mean and median.	7.5
Q10	Find the Karl Pearson coefficient of correlation from the following data	7.5

Husband Age	24	27	28	28	29	30	32	33	35	35	40
Wife Age	18	20	22	25	22	28	28	30	27	30	22