JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2EXAMINATION- 2025

B.Tech-I Semester (CSE/IT/ECE/CE)

COURSE CODE (CREDITS): 25B11MA113 (4) MAX. MARKS: 25

COURSE NAME: MATHEMATICS-I

COURSE INSTRUCTORS:MDS,PKP*,NKT,RKB MAX. TIME: 1 Hour 30 Min

Note:(a)All questions are compulsory.

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

Q.No	Question	CO	Marks
Q1	Using Chain rule, evaluate $\frac{\partial w}{\partial u}$ and $\frac{\partial w}{\partial v}$ at the given point (u,v), where $w = xy + yz + xz, x = u + v, y = u - v$ and $z = uv$, $(u,v) = \left(\frac{1}{2}, 1\right)$.	1	3
Q2	If $u = tan^{-1}\left\{\frac{(x^3+y^3)}{(x-y)}\right\}$ then using Euler's theorem for homogenous function, find the value of $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$.	1	3
Q3	Find all the points of local maxima and minima and corresponding maximum and minimum values of the function $f(x) = 2x^3 - 21x^2 + 36x - 20$	1	3
Q4	Use Lagrange's method to find the point on the plane $ax + by + cz = p$ at which the function $f(x,y,z) = x^2 + y^2 + z^2$ has a minimum value and find this minimum.	1	3.5
Q5	Change the order of integration in $\int_0^1 \int_{x^3}^{2-x} xy\, dy\, dx$ and hence evaluate it.	2	3.5
Q6	Find by double integration the area lying between the parabola $y = 4x - x^2$ and the line $y = x$.	2	3
Q7	Using the definition of Gamma function or otherwise evaluate $\Gamma\left(\frac{1}{2}\right)$	2	3
Q8	Evaluate $\int_0^3 \frac{1}{\sqrt{9-x^2}} dx$ using Beta and Gamma functions.	2	3