JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

Ph.D-I Semester (Maths)

COURSE CODE (CREDITS): 18P1WGE101 MAX. MARKS: 25

COURSE NAME: Research Methodologies Incl Quantitative Methods and Comp Applications

COURSE INSTRUCTOR: 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

(c) Scientific calculators are allowed.

Q.No	Question	Marks
Q1.	Define Mathematical Modelling and its types.	4
Q2.	Differentiate between Stochastic and deterministic modeling with example.	4
Q3.	Define calendaring process related to offset printing process. Explain different types of calenders with the help of diagrams.	4
Q4.	Differentiate between Hertz and Meijer's model related to contact mechanics.	4
Q5.	Find the solution of heat equation $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ subjected to the conditions $u(x,0) = 0, u(0,t) = 0$ *and* $u(1,t) = t$ using Crank-Nicolson method taking $k = \frac{1}{16}$ *and* $h = \frac{1}{4}$	5
Q6.	Obtain the general solution of wave equation $\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^2 y}{\partial x^2}$ using separation of variables method.	4