JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

Ph D (CE)

COURSE CODE (CREDITS): 24P1WCE232 (3) MAX. MARKS: 15

COURSE NAME: CHARACTERIZATION OF MATERIALS

COURSE INSTRUCTORS: DR SAURAV MAX. TIME: 1 Hour

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	A crystal with a cubic lattice has a lattice constant a=4.0A°. It is analyzed using Cu Kα radiation of wavelength λ=1.54A°. (a) Calculate the Bragg angle θ for the first-order (100) reflection. (b) Calculate the 2θ value for the (110) plane. (c) Identify the possible crystal structure (SC, BCC, FCC) if the first three observed peaks correspond to (110), (200), (211) planes.	2	3
Q2	The enthalpy of hydration, measured using an isothermal calorimeter for different Bogue's compounds of OPC at 7 and 28 days, is presented in Fig. 1. Using these data, calculate the total heat of hydration for the cement.	1	3