JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

MSc Semester-3 (PMS)

COURSE CODE (CREDITS): 24MSWPH331 (3) MAX. MARKS: 15

COURSE NAME: Thin Films

COURSE INSTRUCTORS: HAZ MAX. TIME: 1 Hour

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

(b) Marks are indicated against each question in square brackets.

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

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Q1. Calculate the surface energy of the lattice planes (100), (110), and (111) for a simple cubic lattice.

[3 **marks**]

Q2. What is Homogenous Nucleation? Derive the expression for the critical radius of a nucleus.

[3 **marks**]

Q3. What are the different types of thin film growth? Discuss with examples. [3 **marks**]

Q4. Discuss the effect of substrate temperature on the nucleating islands during thin film growth.

[3 **marks**]

Q5. Derive Fick's second law of diffusion. [3 **marks**]