Roll No.: (8)

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2023

B.Tech-VII Semester (CSE/IT/CE/BI)

COURSE CODE(CREDITS): 18B1WPH731(03) MAX. MARKS: 15

COURSE NAME: Nanotechnology

COURSE INSTRUCTORS: Dr. Ragini Raj Singh MAX. TIME: 1Hour

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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Q.1. Draw the diagram which can correlate bulk material and nanostructures with their density of states.

[CO:1 ; Marks:2]

Q.2. What are the disadvantages and limitations of top down approach? Why bottom up approach is preferred?

[CO:1 ; Marks:2]

Q.3. Nanoparticles have unique set of properties with respect to their bulk counterparts, discuss.

[CO: 1; Marks:2]

Q.4. Discuss the application of nanoparticles in
(i) Cosmetics (ii) Displays (iii) Lubricants (iv) Military battle Suits

[CO:2 ; Marks:4]

Q.5. (a) What is the surface area to volume ratio for a cube that measures 4 nm on each side?

[CO:1 ; Marks:1]

(b) What is the surface area to volume ratio for a sphere whose diameter measures 5 nm?

[CO:1 ; Marks:1]

(c) Calculate the ΔG at 310 K for the following reaction

$2NO(g)+O_2(g) \rightarrow 2NO_2(g)$

Given ΔH=-120 KJ and Δs=-150 JK^{-1}

[CO:2 ; Marks:1.5]

(d) Calculate ΔG for a reaction where ΔH is equal to 40 KJ and ΔS is equal to 145 J/K at 320 K. Is it a spontaneous reaction?

[CO:3 ; Marks:1.5]