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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Make-up Examination-Nov-2025

COURSE CODE (CREDITS): 18B1WPH731 (03)

MAX. MARKS: 25

COURSE NAME: Nanotechnology

COURSE INSTRUCTORS: Dr. Ragini Raj Singh

MAX. TIME: 1 Hour 30 Minutes

**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
Q.1.	Write down 5 different physical properties that change and a reason why in nanoparticles?	1	2.5
Q.2.	At the nanoscale, the behavior of the materials changes; how and why does it happen?	1	2.5
Q.3.	List and discuss the characterization parameters of nanoparticle materials.	1	2.5
Q.4.	With reference to nanoparticle synthesis discuss homogeneous and heterogeneous nucleation both graphically and mathematically. Also discuss which nucleation is predominant in nanoparticle synthesis and why?	2	4
Q.5.	Is there any difference in the vapor phase growth and liquid phase growth of nanoparticles? Discuss both the methods with respect to their advantages and disadvantages.	2	2.5
Q.6.	Discuss any two applications of nanomaterials with respect to your field of studies. Describe all the aspects such as type of material, its synthesis technique, how it is being employed along with its pros and cons.	2	4
Q.7.	Why the bottom up synthesis methods is considered key to inexpensive nanofabrication, especially on comparing top-down approaches?	3	3
Q.8.	Compared to single-wall carbon nanotubes, what is different in multi-walled carbon nanotube structures? Discuss various models of MWNT and explain the pulsed laser method to prepare carbon nanotubes.	3	4