

- (b) What is nano pollution? Discuss the sources, effects, and management strategies of nano-pollution in air, water, and soil. (10)

5. Write short notes on the following (Any three):
(5x3=15)

- (i) Nanoscale assembly of microorganisms
- (ii) Nanomaterial-cell interaction
- (iii) Applications of nanomedicines in diagnostics
- (iv) lab-on-chip devices

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5172

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Unique Paper Code : 2234000015

Name of the Paper : GE: Nanobiology

Name of the Course : B.Sc./B.A/B.Com - Zoology
Exam - 2025

Semester : VI (NEP-UGCF)

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. Attempt any **FOUR QUESTIONS** in all, and **Question no. 1** is **COMPULSORY**.

1. (a) Define the following terms : (5x1=5)

(i) Dendrimers

(ii) Biosynthesis

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(iii) Carbon nanotubes

(iv) Graphene

(v) Liposome

(b) Expand the following terms: (5x1=5)

(i) DLS

(ii) UV-vis

(iii) HR-TEM

(iv) STM

(v) CNTs

(c) Mark True or False: (5)

(i) All nanoparticles used in environmental applications are biodegradable.

(ii) The size and surface charge of nanoparticles do not affect their circulation time in the bloodstream.

(iii) Nanoparticles can only be used for the removal of organic pollutants from wastewater.

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(iv) Pharmacokinetics involves the study of drug levels in body fluids over time.

(v) Upon entering cells, nanoparticles can provoke significant structural and functional changes.

2. Differentiate between the following (5x3=15)

(i) Bulk materials and Nanomaterials

(ii) Scanning and Transmission electron microscopy

(iii) Nanofibres and Nanotubes

3. (a) What are colorimetric biosensors, and how do they indicate the presence of a target analyte? Give one biomedical application. (5)

(b) Explain the role of nanoparticles in interacting with biological membranes and ion channels. How do these interactions influence drug uptake and toxicity? (10)

4. (a) Describe how nano-adsorbents help remove water contaminants. (5)

P.T.O.