

This question paper contains **3** printed pages]

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S. No. of Question Paper : **5848**

Unique Paper Code : **2234000015**

Name of the Paper : **Nanobiology**

Name of the Course : **B.Sc. (H) Zoology (GE)**

Semester : **VI (NEP-UGCF)**

Duration : **2 Hours**

Maximum Marks : **60**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *four* questions in all including

Question No. **1**, which is compulsory.

1. (a) Fill in the blanks : 1×5=5

- (i) The intersection of nanotechnology and biology is defined as
- (ii) Nobel Prize-winning scientist is known as the “Father of Indian Nanotechnology”.
- (iii) The prefix “nano” is derived from the Greek word *nanos*, which literally means
- (iv) DNA molecules are considered a “natural” nanomaterial.

P.T.O.

(v) Scientist synthesized colloidal “ruby” gold nanoparticles in 1857, demonstrating that nanomaterials have different optical properties.

(b) Define the following (any six) : 1×6=6

(i) Nanotechnology

(ii) TEM

(iii) Active targeting

(iv) Nanotoxicity

(v) Metal nanoparticles

(vi) Point of care diagnostics

(vii) AFM.

(c) Differentiate between : 2×2=4

(i) Bulk material and Nano materials

(ii) Drug delivery and Gene delivery.

2. (a) Explain the different types of materials to synthesize the nanoparticles. How one can control the size, shape and surface properties with examples ? 10

(b) Write applications of nanoscale assembly. 5

3. (a) Why nanomedicines are transformative ? Write the applications of nanomedicines. Write the different types of materials used in nanomedicines. 9
- (b) What is drug encapsulation ? Explain the different techniques of drug encapsulations. 6
4. (a) What is Advanced (Novel) Drug Delivery Systems (NDDS) ? Define the types of NDDS and write characteristics. 9
- (b) Explain gene delivery and write different types of methods with its applications. 6
5. Explain the effect of nanomaterials on human health. Write the factors affecting nanotoxicity and mechanism of toxicity. 15
6. Write short notes (any *three*) : 5×3=15
- (a) Viral Nanoparticles (VNPs)
- (b) Biogenic Synthesis
- (c) Applications of Microorganism-Based Nanoscale Assembly
- (d) The Enhanced Permeability and Retention (EPR) effect
- (e) Nanoparticles release of nutrients and pesticides.