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BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – B.Sc.(BT)-Hons-2023
Course Name – Nanobiology
Course Code - BBT60206
(Semester VI)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Nanobiology is the study of interaction between
a) Biology and chemistry b) Nanomaterials and biological systems
c) Physics and biology d) Polymers and metals

(ii) Nanotechnology deals with materials at the scale of
a) 1–10 μm b) 10–1000 μm
c) 1–100 nm d) 100–1000 nm

(iii) The term nanotechnology was first introduced by
a) Einstein b) Richard Feynman
c) Louis Pasteur d) Watson

(iv) Nanoparticles are characterized by their
a) Large volume b) Low surface area
c) High surface area to volume ratio d) Low reactivity

(v) Which unit is used to measure nanoscale dimensions?
a) Micrometer b) Millimeter
c) Nanometer d) Centimeter

(vi) Which biological molecule commonly forms corona around nanoparticles?
a) Lipids b) Proteins
c) DNA d) Carbohydrates

(vii) Protein corona formation affects nanoparticle
a) Color b) Biological identity
c) Density d) Size only

(viii) Nanobiology applications include
a) Crop breeding b) Drug delivery
c) Textile production d) Mining

(ix) Nanocarriers are mainly used for

a) Storage
b) Targeted delivery
c) Waste removal
d) Cooling

(x) Nanoparticles improve drug delivery by

a) Increasing toxicity
b) Controlled release
c) Reducing solubility
d) Blocking absorption

(xi) Nanoparticles improve drug action by increasing

a) Toxicity
b) Side effects
c) Bioavailability
d) Cost

(xii) Nanopharmaceuticals are mainly used for

a) Imaging only
b) Drug delivery
c) Food processing
d) Waste treatment

(xiii) Nanobiology in noninfectious diseases is useful in

a) Cancer therapy
b) Bacterial culture
c) Sterilization
d) Fermentation

(xiv) Nanomaterials help in early disease diagnosis by

a) Increasing color
b) Signal amplification
c) Reducing enzymes
d) Destroying cells

(xv) Biosensors mainly convert biological signals into

a) Heat
b) Electrical signals
c) Light only
d) Pressure

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define nanomaterials and state the size range that characterizes them. (3)
3. Distinguish between top-down and bottom-up approaches of nanomaterial synthesis. (3)
4. Outline the steps involved in biological (green) synthesis of nanoparticles. (3)
5. Summarize the role of nanocomposites in biotechnology and medicine. (3)
6. Mention the biomedical applications of nanomaterials (3)

OR

Define multimodal nanoparticles in nanomedicine (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Discuss the advantages and limitations of the bottom-up approach for nanomaterial synthesis. (5)
8. State the purpose of characterizing nanomaterials. (5)
9. Explain how nano-biostimulants enhance plant tolerance to abiotic stress conditions. (5)
10. Explain the impact of nanomaterials on soil microbial communities and soil fertility. (5)
11. Discuss the classification of nanomaterials based on shape and write applications of each type. (5)
12. Discuss the role of nanobiology in the management of infectious diseases (5)

OR

Explain the contribution of nanobiology in noninfectious diseases (5)

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