

Ph.D. Course Work (Aug, 2022)
PHCH 103-Elective Paper: CHEMISTRY
NANOCHEMISTRY

Time: Three Hours

Maximum Marks: 100

(Write your Roll No. at the top immediately on receipt of this question paper)
Answer ALL questions. All parts of a question must be answered in continuation. Start answering each question on a new page. Cite examples and draw labeled diagrams.

Q1. Short Answer Type; attempt any 10 (not more than half page) 10×2=20

- i) Single-molecule detection.
- ii) Nanostructured monoliths.
- iii) lipid-based colloidal nanodrug-delivery systems.
- iv) Transmission electron microscopy.
- v) Scanning electron microscopy
- vi) Nanohybrids.
- vii) Protamine-based nanoparticulate drug carriers.
- viii) Role of nanotubes in cellular manipulation.
- ix) Recent trends in polymeric micelles research.
- x) Hydrogel-based nanoparticulate drug-delivery systems.
- xi) Nanomedicine in oncology.
- xii) Nanomedicine in disorders of the central nervous system.
- xiii) Electrospun nanofibers.
- xiv) Quantum dots.
- xv) Nanocontainer technology.

Q2. Short note type; Attempt any 04 (not more than two pages) 4×5=20

1. What is methods used to characterization of nanomaterials?
2. Highlights the key characteristics of gold and silver nanospheres.
3. What are the Polymer-Based Nanoparticulate Drug-Delivery Systems? Discuss with an example.
4. Write a short note on reticuloendothelial systems.
5. What is nanoengineered prosthetics? Describe the composition and functions of the same with suitable illustrations.
6. Discuss mechanisms of inhibition of infections by nanomaterials.

7. What do understand by term optical tweezers?

Q.3. Long note type (no limit of pages)

3×20=60

1. Discuss the two approaches used in the synthesis of nanomaterials.

OR

Explain polymeric micelles and how can they impact the drug efficacy give special emphasis on solubilization of drugs.

2. Define nanoparticles tagging. What are the practical application in targeted drug delivery?

OR

Discuss the emerging trends in nanotechnology applications in targeted drug delivery.

3. How nanotechnology plays an important role in molecular diagnostics and drug discovery, write with suitable illustrations and discuss their advantages over the conventional medicines.

OR

What are the personalized medicine, and how nanochemistry plays important role in developing stem-cell-based therapies? Highlight the major discoveries.
