

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE

CHEMISTRY DEPARTMENT

BScED and CHEMICAL TECHNOLOGY

 **AUG 2023**

COURSE: CH 452: NANO CHEMISTRY

Duration: 2 Hrs

ANSWER ANY FIVE (5) QUESTIONS. EACH QUESTION CARRIES 20 MARKS.

1. (a) State any five fundamental properties of materials that can be altered by patterning matter on the nanometer length, such that the chemical composition remains unchanged. **10 marks**

- (b) State any five differences in material properties between bulk gold and nano gold. **10 marks**

2. Complete the table below:

	Property	Elucidation technique
1	morphology	
2	Surface force measurement	
3	Surface roughness	
4	Imaging with atomic level resolution	
5	Lattice parameters	

10 marks

3. Nano particles are broadly divided into various categories depending on their morphology, size and chemical properties. State any 5 classes in which these nanoparticles are grouped. **10 marks**
4. (a) Define the following: Quantum Well, Quantum Dot, Top-down approach, **6 marks**
- (b) What is the difference between nanoscience and nanotechnology? **6 marks**
- (c) Silver nanoparticles are commercially used for what application? **2 marks**
- (d) State any three factors of concern that will influence drug delivery. **6 marks**

5. Describe the general toxicity associated with nanoparticles and other nanomaterials. **20 marks**
6. Describe the application of nanoparticles in protein detection. **20 marks**

The End of Question Paper