

KATHMANDU UNIVERSITY
End-Semester Examination
February/March, 2019

08 MAR 2019
Course : PHYS403
Semester: I
F.M. : 55

Level: B. Sc.
Year : IV
Time: 2hrs. 30 mins.

SECTION "B"

[5 Q × 4 = 20 marks]

1. Differentiate between nanoscience and nanotechnology?
2. Write some unique properties of single walled carbon nanotubes.

OR

Write the primitive vectors and calculate the atomic positions of Ga and N atoms in diamond structure.

3. Define the working principle of scanning tunneling microscope.
4. How nanotechnology is utilized in energy and health sectors?
5. Derive the formula for atomic structure factor of BCC lattice.

SECTION "C"

[5 Q × 7 = 35 marks]

6. Describe the sol-gel method used in nano fabrication with some examples.

OR

Describe at least three different defects on materials with applicable theory.

7. Write the basic features of quantum dot and its future application fields.
8. Explain how small angle X-ray scattering is used to characterize the nanomaterials?
9. Explain the term alloy with some properties and write their distinct character comparing with parent elements (compounds).
10. Write the vacancy diffusion dynamics with mathematical formulas.

OR

Analyze the challenges and opportunities associated to the use of nanomaterials.

