

**MAHATMA GANDHI UNIVERSITY**  
**CBCSS B.A/B Sc / B.Com PROGRAMMES 2011**  
**Fifth Semester**  
**Open Course: CH5DOI.6: Nanoscience & Nanotechnology**  
**Model Question Paper**

TIME: 3 Hours

Max. Weightage : 25

**Section A**

(Answer all questions. A bunch of 4 questions carries a weightage of 1)

- I
1. 1 nanometer = ----- meter.
  2. Fullerenes were named after-----
  3. What is the expansion of UPES?
  4. What is the value of  $h$  in Planck's equation?
- II
5. Arrange the following electromagnetic radiations in the increasing order of energy: IR radiation, X-ray, radiowaves, UV radiation
  6. SIMS is the abbreviation of-----
  7. Give one example of a quantum dot.
  8. What is/are the element(s) present in fullerene?
- III
9. Who made the historical statement, "There is plenty of rooms at the bottom"?
  10. What is SPR in UV-visible studies of nanomaterials?
  11. Name one nanoparticle used for antibacterial applications.
  12. Give one therapeutic application of  $C_{60}$ .
- IV
13. What is the opposite of Grey Goo?
  14. Name one method used for preparing carbon nanotubes?
  15. Name one destructive nanobot.
  16. Nanomaterial used in MRI?

**SECTION B**

[Answer any five questions. Each carries a weightage of 1]

17. Why objects in the nanoscale cannot be seen by visible light?
18. What are quantum dots?
19. What are nanosensors?
20. What is meant by top-down and bottom-up approaches?
21. What makes the fusion of nanotechnology and biology possible?
22. What makes the nanoparticle suitable for nasal administration?
23. Why gold nanoparticles are frequently used in the synthesis of nano-bio assemblies?
- 24.

### **SECTION C**

[Answer any four questions. Each carries a weightage of 2]

25. Why nanotech weapons are superior over nuclear weapons?
26. Explain the usefulness of “smartdust”.
27. What are the characteristics of electromagnetic radiation?
28. Explain the uses of TEM and SEM in the study of nanosystems.
29. What are the architectural characteristics of carbon nanotubes?
30. Write a note on nano-bio fusion.

### **SECTION D**

[Answer any two questions. Each carries a weightage of 4]

31. Write a note on the ethical and commercial aspects of nanotechnology.
32. Write an essay on the Feynmans hypothesis and the important milestones in the development of nanotechnology.
33. Write notes on the applications of nanomaterials in: (a). War (b). Medicine