

**BHARATA MATA COLLEGE, THRIKKAKARA**  
**MODEL EXAMINATION FEBRUARY 2020**  
**B. Sc. CHEMISTRY Semester VI**  
**NANOCHEMISTRY AND NANOTECHNOLOGY**

TIME: 3 hrs

Max. Marks: 80

**Section A**

**Answer any 10 Questions**  
**Each question carries 2 marks**

1. What do you mean by bottom-up approach for nanoparticle synthesis?
2. Give any two applications of monolayer protected metal nanoparticles.
3. State Moore's Law.
4. Give any two applications of fullerenes.
5. What is the advantage of ETEM ?
6. How are nanomaterials classified based on their dimensions?
7. Give a few applications of SAMs.
8. What do you mean by top-down approach for the synthesis of nanoparticles?
9. What is CVD?
10. Comment on Arc discharge method for nanosynthesis.
11. Discuss the destructive applications of nanomaterials.
12. Comment on nanobased drug delivery.

**(10 x 2 = 20)**

**Section B**

**Answer any six questions**  
**Each question carries 5 marks**

13. Explain the principle of XPES. How can it be used for characterization of nanomaterials?
14. What is SIMS? How is it useful in nanomaterial characterization?
15. What are SAMs? How are they prepared?
16. Discuss the contributions of nanomedicines in diagnosis and therapy.
17. Write a short note on nanosensors based on quantum size effects.
18. Differentiate between SEM and TEM.
19. What are nanobiosensors? What are their applications?
20. What are monolayer protected metal nanoparticles? How are they synthesized?
21. Explain the working of Scanning Probe Microscopy.

**(6 x 5 = 30)**

### **Section C**

**Answer any *two* questions**

**Each question carries 15 marks**

22. With the help of a neat labelled diagram explain the characterization of nanomaterials using SEM
23. Elaborate the synthesis, properties and applications of carbon nanotubes.
24. Explain how nanomaterials are characterised using TEM, with the aid of a neat labelled diagram.
25. Elaborate the synthesis, properties and applications of quantum dots.

**(2 x15 =30)**