

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86**  
**(For candidates admitted during the academic year 2019-20& thereafter)**

**SUBJECT CODE: 19CH/PE/NC15**

**M.Sc. DEGREE EXAMINATION, APRIL 2021**

**BRANCH IV - CHEMISTRY**

**FOURTH SEMESTER**

**COURSE: ELECTIVE**

**PAPER: NANOCHEMISTRY**

**TIME: 90 minutes**

**MAX.MARKS: 50**

**SECTION-A**

**Answer all the questions**

**(11 x 1 = 11 Marks)**

**I. Choose the correct answer:**

- The SPR wavelength of gold nanoparticle is around  
a) 620 nm      b) 520 nm      c) 590 nm      d) 640 nm
- The melting point of the nanoparticle \_\_\_\_\_ with decrease in the size  
a) Decreases      b) Increases      c) remains same      d) almost doubles
- The technique in which a high voltage power supply is used to prepare nano fibers from solution is \_\_\_\_\_  
a) Lithography      b) PVD      c) Electrospinning      d) high energy ball milling
- The elastomeric material used in soft lithography is  
a) Polydimethylsiloxane      b) Polyurethane      c) Polyisoprene      d) Butyl rubber

**II Match the following:**

- |                     |                        |
|---------------------|------------------------|
| 5. Ball milling     | (a) Top-down approach  |
| 6. Laser ablation   | (b) Chemical technique |
| 7. Solgel method    | (c) Mechanical method  |
| 8. Photolithography | (d) Physical technique |

**III Answer in a line or two:**

- How is wide-angle x-ray diffraction used in the characterization of nanocomposites?
- Write any two properties of carbon nanotubes that makes it an excellent choice for a variety of applications.
- What are nano onions?

**SECTION – B**

**Answer any three questions**

**(3x8=24 marks)**

12. Discuss Surface Plasmon Resonance with specific reference to gold nanoparticles and list out the factors that affect the intensity and wavelength of the SPR peak.
13. Write in detail the impact of nanomaterials on the environment and the challenges faced in overcoming this.
14. Explain in detail the soft lithography technique and discuss the advantages and disadvantages of this technique.
15. Discuss the applications of nano materials in the field of medicine.

**SECTION – C**

**Answer any One question**

**(1x15=15 marks)**

16. a) Explain the characterization of nano composites using TEM and SEM. (7)  
b) Write a note on the synthesis of nano fibers by electro spinning method (8)
17. a) Discuss the quantum confinement effects in nano particles. (7)  
b) Compare CVD and PVD methods in the synthesis of nano particles (8)

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