
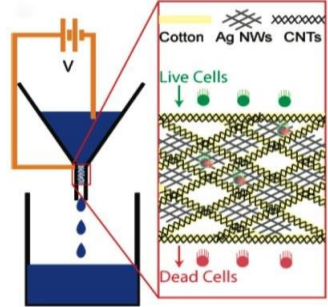
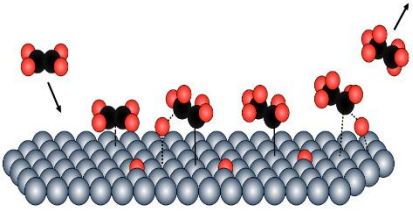
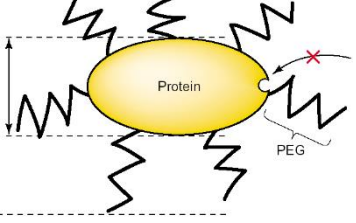
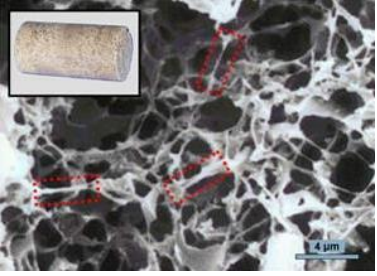


| Name: | |  | |
|--|---|--|-----|
| Enrolment No: | | | |
| UPES End Semester Examination, May 2023 | | | |
| Course: Introduction to Nanotechnology Program: B.Tech (Advance Materials & Nano Technology) Course Code: MECH 2049 | | Semester: IV Time : 03 hrs. Max. Marks: 100 | |
| Instructions: 1) Read all questions carefully. 2) Attempt all questions under one section in one place. | | | |
| SECTION A (5Qx4M= 20 Marks) | | | |
| S. No. | | Marks | CO |
| Q 1 | Distinguish between “grafting to” and “grafting from” approaches for nanomaterials modifications. | 4 | CO1 |
| Q2 | Describe the parameters influencing the nanowires synthesis using electrospinning. | 4 | CO1 |
| Q3 | Explain the relation of viscosity and temperature for a high performance nano-lubricant. | 4 | CO1 |
| Q4 | What role nanoreporters and nanorobots play in oil industry? | 4 | CO1 |
| Q5 | Describe the role of silver nanowires for water sterilization. | 4 | CO1 |
| SECTION B (4Qx10M= 40 Marks) | | | |
| Q6 | Describe the role of graphene oxide and reduced graphene oxide nanosheets with respect to cationic and anionic dyes for removal of dyes from industrial waste. | 10 | CO3 |
| Q7 | Provide a detailed nomenclature of carbon nanotubes (CNTs) and describe two synthesis techniques for CNT preparation. | 10 | CO2 |
| Q8 | How are quantum dots more useful than commercial approaches for tumor selective cancer treatment? | 10 | CO3 |
| Q9 | What kind of fluids, nanoparticles (metallic, oxide and carbon) and surfactants can be used (name 3 of each) to prepare the nanofluids? <p style="text-align: center;"><i>Or</i></p> Explain the following: <i>i) Optical properties of quantum dots.</i> <i>ii) Phonon Density of States.</i> | 10 | CO2 |

SECTION-C
(2Qx20M=40 Marks)

| | | | |
|------------|--|------------------------|----------------------------|
| <p>Q10</p> | <p>(a) Explain polymeric micelles formation including their role for temperature and pH responsive targeted drug release.</p> <p>(b) Explain the following. i) <i>Chemical vapor deposition (CVD)</i>. ii) <i>Molecular beam epitaxy</i>.</p> | <p>10 +10</p> | <p>CO2</p> |
| <p>Q11</p> | <p>What is the significance of wave function ψ. Deduce the time dependent and independent Schrodinger wave equation.</p> <p style="text-align: center;"><i>Or</i></p> <p>Explain the following figures [5 Marks each].</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="256 856 727 1270" style="width: 45%;">  <p>[1] Purification</p> </div> <div data-bbox="730 856 1177 1270" style="width: 45%;">  <p>[3] Catalysis</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div data-bbox="256 1276 727 1640" style="width: 45%;">  <p>[2] Nano-Drug</p> </div> <div data-bbox="730 1276 1177 1640" style="width: 45%;">  <p>[4] Nanorobots</p> </div> </div> | <p>20 Marks</p> | <p>CO2+ CO3</p> |