

<p>Q. Why are zinc oxide nanoparticles used in sunscreen?</p> <p>a. absorb harmful UV b. make it waterproof c. hide skin blemishes</p> <p>A. a – absorb UV</p>	<p>Q. In Lab-on-a-chip a sample travels down tiny channels where nanosized components and sensors</p> <p>a. identify specific molecules that warn of illness b. deliver targeted drugs c. kill cancer cells</p> <p>A. a</p>	<p>Benefits of targeted drug delivery include:</p> <p>a. Reduce toxicity, side-effects, cost b. Deliver drugs when needed c. Deliver drugs where needed d. All of the above</p> <p>A: d – all of the above</p>	<p>True or False A lab-on-a-chip miniaturizes all the steps needed to process a medical sample and detect disease.</p> <p>Answer: True</p>	<p>Anticipated benefits of nanotechnology growing organ and tissue replacements include:</p> <p>a. reduce waiting time b. no shortages c. less chance of organ rejection d. all of the above</p> <p>A. d - all of the above</p>	<p>True or False In Nanoshell-Assisted Tumor Ablation nanoshells form a barrier that stops the growth of tumors.</p> <p>False. Nanoshells attach to cancer cells forming a target for lasers to kill the cancer.</p>
<p>Why are scientists at Oxford University studying how the tails - or 'flagella' - of some bacteria work – to make...</p> <p>A. a new drill B. a nanorobot rotor C. artificial hair implants.</p> <p>Answer: B</p>	<p>This recent application of nanotechnology is glass coated in highly activated titanium dioxide, to be water repelling, antibacterial, and to catalytically destroy chemical agents.</p> <p>a. safety glasses b. self-cleaning window c. drinking glasses</p> <p>A. b self-cleaning windows</p>	<p>Why are scientists researching adding cerium oxide to diesel fuel?</p> <p>a. to reduce rusting in gas tanks b. to improve fuel economy by reducing the degradation of fuel consumption over time c. to increase the price of crude oil</p> <p>A. b</p>	<p>A process for making ceramic and glass materials, involving the transition from a liquid 'sol' phase to a solid 'gel' phase is called a:</p> <p>a. phase transition process b. gelatin process c. sol-gel process d. all of the above</p> <p>A. c</p>	<p>Self-assembly is one way for:</p> <p>a. bottom-up fabrication b. top-down fabrication c. top-up fabrication d. top-down fabrication</p> <p>A: a bottom-up</p>	<p>SEM stand for</p> <p>a. self-assembly electronic molecules b. scanning electron microscope c. smaller-Electro-Mechanical</p> <p>Answer: B</p>
<p>A scanning electron microscope makes pictures by moving a beam of focused ___ across an object and reading the scattered electrons.</p> <p>a. electrons b. protons c. photons (light)</p> <p>A: a electrons</p>	<p>A nanocoating used instead of thicker paint on aircraft improves:</p> <p>a. how high it can go. b. how fast it can go. c. fuel consumption since it decreases weight.</p> <p>A: c – lighter planes</p>	<p>Which properties of Carbon Nanotubes (CNT) make them candidates for efficient, long-lasting emitters in flat screens?</p> <p>a. strength and sharpness b. conductivity and inertness c. all of above</p> <p>A. c- all of above</p>	<p>True or False Researchers think nanospheres will be more durable than current solid lubricants because of their controlled shape.</p> <p>True</p>	<p>True or False One possible application of nano-scaled magnetic devices is data storage.</p> <p>True</p>	<p>True or False Although ceramics are hard, brittle and difficult to machine, at nanoscales, ceramics become more plastic (ductile).</p> <p>True</p>
<p>Energy efficiency results from:</p> <p>a. improved insulation systems b. efficient lighting c. efficient combustion systems d. lighter and stronger materials in the transportation sector e. all of the above</p> <p>Answer E</p>	<p>Nanofiltration uses nanoporous membranes with pores smaller than</p> <p>a. 10 nanometers b. 10 centimeters c. 10 meters</p> <p>A: a – 10 nm</p>	<p>Ultrafiltration uses membranes with pores between:</p> <p>a. 10 and 100 nm b. 10 and 100 cm c. 10 and 100 m</p> <p>A: a 10 and 100 nanometers</p>	<p>To remove heavy metal contaminants from waste water by magnetic separation techniques uses what?</p> <p>a. quantum dots b. carbon nanotubes c. magnetic nanoparticles</p> <p>A: c</p>	<p>Spintronic devices for high density hard drive use the material property of</p> <p>a. tensile strength b. light emission c. electron spin d. mass</p> <p>A. c. electron spin</p>	<p>Optoelectronic devices for communications are superior to electrical devices in</p> <p>a. information loss b. bandwidth c. capacity d. both b and c</p> <p>A: d</p>

<p>Which two of the following are examples of optoelectronic devices:</p> <ol style="list-style-type: none"> photonic crystals quantum dots nanoporous membranes Copper-clad aluminum wire <p>A: a and b</p>	<p>Researchers at the Institute for Soldier Nanotechnologies seek cloth that changes color on command so that soldiers are:</p> <ol style="list-style-type: none"> camouflaged fashionable color coded by team <p>A. camouflaged</p>	<p>Weaving radio communications materials directly into the uniform's fabric provides soldiers with</p> <ol style="list-style-type: none"> Electro-massages Flexibility and lighter loads Ability to pick up more cable stations <p>A. b</p>	<p>Researchers at the Institute for Soldier Nanotechnologies seek improvements for:</p> <ol style="list-style-type: none"> fashion and durability color-coordinated battlefields for satellite surveillance protection and survivability <p>A. c</p>	<p>Researchers at the Institute for Soldier Nanotechnologies want to reduce the weight of an in-field soldier's gear, now</p> <ol style="list-style-type: none"> 10 pounds about 100 pounds 1000 pounds <p>A: b 100 pounds</p>	<p>Researchers at the Institute for Soldier Nanotechnologies want the soldier's uniform to protect the soldier from:</p> <ol style="list-style-type: none"> bullet penetration knife penetration harmful chemicals all of the above <p>A. d all of above</p>
<p>For alternative energy sources, carbon nanotubes may developed for hydrogen storage in:</p> <ol style="list-style-type: none"> fuel cells that convert hydrogen and oxygen into water and heat water that has two hydrogen atoms computer memory devices <p>A: a</p>	<p>What do you call a device that creates topographic maps of the surface of a material by measuring the reflection of light from a deflected cantilever while its a cone-shaped probe at the tip is dragged across the surface?</p> <p>A: Atomic Force Microscope (or AFM)</p>	<p>Conventional microscopes use a series of these to bend light to create a larger image of an object. What do you call the curved pieces of glass that are used to create images?</p> <p>A: Lenses</p>	<p>Conventional microscopes use light to create images. Scanning electron microscopes create higher resolution images by magnifying images using _____ instead of light.</p> <p>A: Electrons</p>	<p>Nanotechnology has found ways to make coatings:</p> <ol style="list-style-type: none"> resistant to ultraviolet light scratch resistant heat resistant self-cleaning all of the above <p>A: e all of the above</p>	<p>Composites of plastics with carbon nanotubes are difficult to manufacture because the nanotubes don't disperse easily. This is because CNTs:</p> <ol style="list-style-type: none"> tend to break tend to bundle conduct heat all of the above <p>Answer b (tend to bundle)</p>
<p>A device that connects a computer virtual-reality interface to a scanning-probe microscope that allows a human user to see and manipulate individual molecules is called a ____.</p> <p>A: Nanomanipulator</p>	<p>What do you call a device for picking up atoms and molecules that uses Carbon Nanotubes at the end of an atomic force microscope with voltages to open and close the nanotube end?</p> <p>A: Nanotweezers</p>	<p>Useful for forming Carbon Nanotubes, a plasma (ionized gas) is created by making gas conduct electricity by applying a large external voltage. This is called:</p> <ol style="list-style-type: none"> Plasma arcing Chemical vapor deposition Sol-Gel Process Nanoelectrodeposition <p>A: a plasma arcing</p>	<p>Useful for forming Carbon Nanotubes, a material is heated to form a gas then allowed to form a deposit as a solid on a surface. This is called:</p> <ol style="list-style-type: none"> Plasma arcing Chemical vapor deposition Sol-Gel Process Nanoelectrodeposition <p>A: b Chemical vapor deposition</p>	<p>Useful for forming nanoholes in materials, a colloidal liquid is transitioned to a solid. This is called:</p> <ol style="list-style-type: none"> Plasma arcing Chemical vapor deposition Sol-Gel Process Nanoelectrodeposition <p>A: c Sol-Gel Process</p>	<p>Used for making thin films, a single layer of a material is placed on a surface in a very controlled way. This is called:</p> <ol style="list-style-type: none"> Plasma arcing Chemical vapor deposition Sol-Gel Process Nanoelectrodeposition <p>A: d. nanoelectrodeposition</p>
<p>Samsung produces NAND and DRAM flash memory chips using manufacturing methods with precision below 100 nanometers. Which 2005 product uses their 4 GB NAND flash memory?</p> <ol style="list-style-type: none"> Dell Computer iPod Nano Toshiba Cell Phone <p>A: b iPod Nano</p>	<p>NanoTwin produces a fiberglass tube with a 40 nm layer of TiO₂ crystals that radiate UV light oxidizing agents that destroy airborne germs and pollutants at the tube's surface. Used for:</p> <ol style="list-style-type: none"> water purification cleaning glass air purification all of the above <p>A: c</p>	<p>Behr Kitchen & Bath paint uses nanosized additives to lend greater density to the water-based acrylic latex carrier for improved:</p> <ol style="list-style-type: none"> hardness/durable water resistance mildew resistance stain and grease resistance all of the above <p>A: e</p>	<p>ArcticShield polyester socks from ARC Outdoors have 19 nanometer silver particles in their fibers to protect against:</p> <ol style="list-style-type: none"> odor and fungus shrinking staining tearing <p>A: a</p>	<p>The spaces between the fibers in standard carbon fiber bats contain only resin, which weakens the bat's power. Easton Sports teamed with Zyvex to create a more responsive bat by filling the spaces with:</p> <ol style="list-style-type: none"> Carbon Nanotubes Fullerenes Nanoclay platelets Quantum Nanodots <p>A. a</p>	<p>Nanowax for skis and snowboards uses self-assembling fluoride polymers and multifunctional nanoparticles to create</p> <ol style="list-style-type: none"> less responsive to temperature superior adhesive excellent gliding all of the above <p>A: d</p>