

## Notes on Environment Science-2024, Gyan Sanchay CSJM University Kanpur

1. **What are renewable materials?**

*Answer:* Renewable materials are natural resources that can be replenished or regenerated over time, such as wood, bamboo, cork, and natural fibers like cotton or wool.

2. **Give two examples of renewable materials used in construction.**

*Answer:* Bamboo and recycled wood are renewable materials commonly used in construction for their sustainability and strength.

3. **Why are renewable materials important?**

*Answer:* Renewable materials reduce reliance on finite resources, minimize environmental impact, and promote sustainable practices in industries like construction, fashion, and energy production.

4. **What is the difference between renewable and non-renewable materials?**

*Answer:* Renewable materials regenerate naturally over time (e.g., bamboo, cotton), while non-renewable materials, such as metals and fossil fuels, are finite and deplete with use.

5. **Name one renewable material used in bioplastics.**

*Answer:* Cornstarch is a renewable material often used in the production of biodegradable bioplastics.

6. **How does the use of renewable materials contribute to sustainable development?**

*Answer:* Using renewable materials reduces waste, conserves energy, lowers carbon footprints, and supports eco-friendly industrial practices, ensuring resources are available for future generations.

Short-answer questions with answers related to the **role of mechanical engineering in waste segregation and management:**

---

1. **What is the role of mechanical engineering in waste management?**

*Answer:* Mechanical engineering designs and develops machines and systems for efficient waste segregation, recycling, composting, and disposal.

---

2. **Name a mechanical process used in waste segregation.**

*Answer:* Mechanical processes like **magnetic separation** are used to segregate metals from mixed waste.

---

3. **How does mechanical engineering improve recycling efficiency?**

*Answer:* Mechanical engineering improves recycling efficiency by designing shredders, crushers, and balers that prepare materials like plastic and metals for reprocessing.

---

4. **What is the importance of automation in waste segregation?**

*Answer:* Automation, enabled by mechanical engineering, speeds up waste sorting, reduces human intervention, and increases accuracy, as seen in conveyor-based segregation systems.

---

5. **Give an example of mechanical equipment used in waste management.**

*Answer:* A **trommel screen** is used to separate waste by size, sorting materials into categories like organic matter and recyclables.

---

6. **How do mechanical engineers contribute to landfill management?**

*Answer:* Mechanical engineers design landfill compactors and leachate management systems to optimize space and reduce environmental contamination.

---

7. **What role does mechanical engineering play in waste-to-energy systems?**

*Answer:* Mechanical engineers design and maintain incinerators, turbines, and biogas plants that convert waste into usable energy like electricity and heat.

---

short answer questions on ecofriendly Nanomaterials

---

1. **What are eco-friendly nanomaterials?**

*Answer:* Eco-friendly nanomaterials are nanoscale materials that are sustainable, non-toxic, and environmentally friendly, used in applications like water purification, energy storage, and green construction.

---

2. **Give two examples of eco-friendly nanomaterials.**

*Answer:* Examples include **cellulose nanofibers** (from plants) and **graphene** (a carbon-based material).

---

3. **How are eco-friendly nanomaterials used in water purification?**

*Answer:* Nanomaterials like silver nanoparticles and titanium dioxide are used to remove contaminants, disinfect water, and degrade pollutants through photocatalysis.

---

4. **What makes nanomaterials eco-friendly?**

*Answer:* Eco-friendly nanomaterials are biodegradable, non-toxic, and derived from renewable resources, causing minimal environmental harm during production and use.

5. **Name one application of eco-friendly nanomaterials in renewable energy.**

*Answer:* Graphene-based nanomaterials are used in the production of **solar cells** and **supercapacitors** for efficient energy storage.

---

6. **How do eco-friendly nanomaterials contribute to sustainable agriculture?**

*Answer:* They are used in smart fertilizers and pesticides, releasing nutrients and chemicals in a controlled manner to minimize environmental impact.

---

7. **What is the role of nanomaterials in reducing pollution?**

*Answer:* Nanomaterials like carbon nanotubes and metal oxides are used in air and water filtration systems to remove pollutants and improve environmental quality.