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ZERO WASTE and R Concept

1. Define Zero waste. (2 mark)

["The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health."

(or)

Zero waste is a philosophy and lifestyle that aims to reduce the amount of waste generated by individuals, households, and businesses to as close to zero as possible. The concept of zero waste is based on the principles of the circular economy, which seeks to eliminate waste and keep resources in use for as long as possible.]

Features of Zero Waste:

The main feature of zero waste is the aim to eliminate waste by minimizing the generation of waste in the first place. Here are some key features of the zero waste approach:

1. Reducing consumption: Avoiding unnecessary purchases and by reducing consumption, we can minimize the amount of waste generated.
2. Reusing items: Instead of throwing items away after use, we can find ways to reuse them. This can include repairing and repurposing items, donating them to charity, or selling them second-hand.
3. Recycling: Recycling involves turning waste materials into new products.
4. Composting: Composting involves turning organic waste, such as food scraps and yard waste, into nutrient-rich soil, provide a sustainable source of fertilizer.
5. Redesigning products and packaging: By designing products and packaging to be more sustainable, we can reduce waste and minimize the environmental impact of manufacturing and production.
6. Mindful consumption: Zero waste encourages mindful consumption by making us more aware of the impact of our choices and purchases on the environment. This can lead to more sustainable and responsible behavior, both as individuals and as a society.

2. **What is R-Concept? (2 mark)**

[Refuse, Reduce, Reuse, Recycle, Rot – these are the “5 Rs” that make up the basic rules of zero waste.]

1. **Refuse:** By refusing, a lot of waste is eliminated at the source. The idea is to refrain from accepting free stuff that becomes instant waste. There are some things you can choose to refuse on a daily basis:
 - disposable coffee cups
 - plastic

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Graphical representation of 5R Concept)

2. **Reduce:** This involves reducing the amount of waste generated by using fewer resources and products.
3. **Reuse:** This involves finding ways to reuse items instead of throwing them away, such as repairing or repurposing items, donating them to charity, or selling them second-hand.
4. **Recycle:** This involves recycling waste materials by turning them into new products.
5. **Rot (what's left over):** Composting food scraps, paper pieces, and wooden or bamboo toothbrushes returns nutrients and fiber back to the earth.

CIRCULAR ECONOMY

3. Explain circular economy concept (2 mark)

[The circular economy aims to create a more sustainable and regenerative system that mimics natural processes, where resources are continuously cycled and regenerated. It involves rethinking the way products are designed, manufactured, and consumed, with a focus on reducing waste, maximizing resource efficiency, and minimizing environmental impact.]

The circular economy is based on four key principles:

1. **Designing out waste and pollution:** This principle involves designing products and processes to minimize waste and pollution throughout their lifecycle. This can include designing products for reuse or recycling, using non-toxic materials, and reducing the use of non-renewable resources.
2. **Keeping products and materials in use:** This principle involves keeping products and materials in use for as long as possible, through strategies such as reuse, repair, refurbishment, and recycling. This can involve creating closed-loop systems where waste from one process becomes the input for another.
3. **Regenerating natural systems:** This principle involves restoring and regenerating natural systems, such as forests, oceans, and soils, through sustainable land use and resource management practices. This can include promoting regenerative agriculture and sustainable forestry practices, and protecting biodiversity and ecosystems.
4. **Fostering collaboration and innovation:** This principle involves fostering collaboration and innovation across different sectors and stakeholders, to create new business models

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The circular economy model:
less raw material, less waste, fewer emissions



Benefits of Circular Economy:

The circular economy offers several benefits, including:

1. **Reduced waste and pollution:** By keeping products and materials in use for as long as possible, the circular economy reduces waste and pollution, reducing the environmental impact of production and consumption.
2. **Resource efficiency:** The circular economy maximizes the use of resources by designing products and processes for durability, reparability, and recyclability, reducing the need for new resources and promoting resource efficiency.
3. **Economic growth and job creation:** The circular economy creates new business opportunities and jobs in areas such as repair, refurbishment, and recycling, contributing to economic growth and development.
4. **Increased resilience:** The circular economy promotes resilience by reducing dependence on finite resources, increasing resource security, and building more sustainable supply chains.
5. **Improved social outcomes:** The circular economy can benefit communities by promoting local production and consumption, creating job opportunities, and reducing environmental and health impacts on vulnerable populations.

Linear Economy: The traditional linear economy model, which is based on the "take-make-dispose" approach. In the linear economy, resources are extracted, used to manufacture products, and then disposed of as waste.

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Linear Economy Vs Circular Economy:

Linear Economy	Circular Economy
Materials flow in a straight line from resource extraction to manufacturing and then to landfill.	Mimics natural processes, where resources are continuously cycled and regenerated.
Value is created by producing and selling as many product as possible	Circular business model builds economic, natural and social capital.
Characterized by wasted resources, excessive pollution, ecosystem degradation, wealth concentration and social inequalities.	Characterized by best utilization of resources, protection of ecosystem and social equalities.

ISO 14000 Series

ISO 14000 is a set of standards created to help companies to reduce their impact on the environment. It's a framework for environmentally-conscious quality management systems by organizations. The ISO 14000 series of standards was introduced in 1996 by the International Organization for Standardization (ISO) and most recently revised in 2015.

The primary objective of ISO14000 series of standard is to promote effective environmental management systems in organizations.

List of ISO 14000 series standards

- **ISO 14001** Environmental management systems - Requirements with guidance for use
- **ISO 14004** Environmental management systems - General guidelines on implementation
- **ISO 14005** Environmental management systems - Guidelines for a flexible approach to phased implementation
- **ISO 14006** Environmental management systems - Guidelines for incorporating eco design
- **ISO 14015** Environmental management - Environmental assessment of sites and organizations (EASO)
- **SO 14020 to 14025** Environmental labels and declarations
- **ISO/NP 14030** Green bonds -- Environmental performance of nominated projects and assets; discusses post-production environmental assessment
- **ISO 14031** Environmental management - Environmental performance evaluation - Guidelines
- **ISO 14040 to 14049** Environmental management - Life cycle assessment; discusses pre-production planning and environment goal setting
- **ISO 14050** Environmental management - Vocabulary; terms and definitions
- **ISO/TR 14062** Environmental management - Integrating environmental aspects into product design and development
- **ISO 14063** Environmental management - Environmental communication - Guidelines and examples

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- **ISO 14064** Greenhouse gases; measuring, quantifying, and reducing greenhouse gas emissions
- **ISO 14090** Adaptation to climate change — Principles, requirements and guidelines