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Subject: General Science and
ability.

⇒ Q No1. (a) Differentiate between Sanitary and industrial Landfills, also describe the land selection criteria for Landfills.

1. ⇒ Difference between Sanitary and industrial Landfills

Sanitary Landfills.

i) Sanitary Landfills are used for the disposal of waste from homes and roads.

ii) From Sanitary landfills, methane is extracted.

Industrial Landfills.

i) Industrial Landfills are used for the disposal of industrial waste and effluent particularly.

ii) Industrial landfills also work as "material reusable facilities" in which, reusable items are extracted and sold.

Sanitary Landfills:

iii) In Sanitary Landfills, layers of clay are used to separate the layers of waste.

iv) In Sanitary Landfills, Pipelines are constructed to extract Landfill gases.

Industrial Landfills:

iii) In industrial Landfills, no such layers are used.

iv) No pipeline connections are used in industrial Landfills.

2) ⇒ Land Selection Criteria for Landfills:-

1. The area and Volume of the land should be sufficient enough to contain waste for several years.

2. The landfill site should not be in close vicinity of the Population

3. They should not be close to water bodies like dams, because of potential risk of contamination that is hazardous to aquatic life.

4.

No major Power transmission or

other infrastructure like sewers, and water supply lines should be crossing through the landfill developmental areas.

5.

Unstable areas that have a significant seismic risk which could cause the destruction of- berms are not recommended for the landfill site.

6.

A significantly fractured geological structure having fault lines should not be selected. The fault lines can allow unpredictable ~~movement~~ ~~movement~~ ~~movement~~ movement of gas within 500 Perimeters of the proposed landfill.

7.

The selection of landfill sites should be based upon the proper assessment of environmental issues.

8.

The landfill site should be near the waste recycling site facility, if not, the waste recycling facility should be planned as an integral part of the landfill site.

⇒ Q. No 1 (b): What is natural radioactivity? How it is different from artificial radioactivity?

⇒ (1). What is Radioactivity:-

Radioactivity is the process of disintegrating the nucleus of an atom of heavier elements. The heavier elements are those elements that have more neutrons than protons in their nuclei. Atoms of the heavier elements are unstable because of the uneven ratio of protons and neutrons in the nucleus. To become stable, they emit radiation: particles and energy.

⇒ (2). Difference between natural and artificial radioactivity?

Radioactivity that occurs on its own is called natural radioactivity. Whereas radioactivity that a man in laboratories induces, it is called artificial radioactivity.

Natural Radioactivity

It occurs naturally.

Artificial Radioactivity

It is initiated by man.

Natural Radioactivity

The Process is spontaneous.

Natural radioactivity occurs only in those elements which possess unstable nuclei.

Artificial Radioactivity

It occurs due to external influence.

Artificial radioactivity occurs in stable nuclei.

⇒ (3) How Artificial Radioactivity takes place?

A slow-moving neutron is bombarded on the nucleus of a stable atom to cause instability in the nucleus. As a result, an alpha particle is emitted and the series of isotopes of the parent atom is produced.

⇒ (4) Types of Radiations:-

There are three types of emissions by radioactive elements.

ii.

Alpha particles

Alpha particle consists of two protons and two neutrons. It has a positive charge. Alpha particle has the same composition of protons and neutrons as a helium atom.

⇒ (ii) Beta Particle:-

Beta particles consist of electrons and have a negative charge.

⇒ (iii)

Gamma radiation:- Gamma radiations are high electromagnetic radiations. They have no mass and charge. It is important to note, not all three radiations are emitted at the same time by the nucleus because it is a random process.

⇒ (5) How radioactivity helps in power generation?

In nuclear reactors, the isotopes of Uranium are bombarded by slow moving neutrons that cause instability of the nuclei of the atoms. As a result, a huge amount of energy is emitted which is used to convert water, in the boiler, into steam. The pressure of steam is used to give motion to turbines for the generation of electricity.

Q. No.1 (c) What is Solid waste? Discuss

the main issues of Solid waste management in our country?

(1) → What is Solid waste?

The disposal of domestic refuse, commercial and industrial solid wastes or semi-solid material is studied under the title solid waste management. The domestic municipal solid waste mostly consists of garbage, waste treatment plants, commercial refuse, air pollution control facilities, construction debris, sludge from the water supply, and other discarded materials.

(2) → Issues of Solid waste management in our country

Following are the issues of solid waste management in Pakistan.

(i) collection systems:- There is no proper collection system.

(ii) Dumping:- Waste is dumped on the streets.

(iii) Landfill sites:- There are no controlled sanitary landfill sites, opening

burning is common.

(v) Awareness:- Citizens are not aware of the relationship between reckless waste disposal and resulting environmental and public health problems.

⇒

Q. NO. 1 (d):

What is the role of oxygen-demanding wastes in water pollution?
How it can be prevented?

1) ⇒ Definition:-

Oxygen-demanding wastes - also known as organic wastes - are water wastes that are decomposed by oxygen-requiring bacteria. These organic wastes can be solids, liquids, or gases coming from the sources like sewage, animal manure, and agricultural runoff, either directly or through leaching.

(2) ⇒ The role of oxygen demanding wastes in water pollution:-

Organic wastes have a significant impact on water quality. When

these materials decompose in water, they consume oxygen, which can lead to the formation of hypoxic - low oxygen - or anoxic - no-oxygen conditions. As a result, the biological oxygen demand to decompose the wastes increases, and the dissolved oxygen level of water reduces drastically. This can be harmful to aquatic organisms and can lead to the release of harmful compounds such as ammonia and hydrogen sulfide. In the long-term, oxygen-demanding wastes can contribute to eutrophication or the over-enrichment of water bodies with nutrients, which can lead to algal blooms and other water quality issues.

(3) ⇒ Ways to prevent oxygen-demanding wastes from water bodies:-

There are a number of ways to prevent oxygen-demanding wastes from polluting water.

i) Municipal and industrial wastewater:-

Municipal and industrial wastewater should be treated to remove oxygen

demanding wastes before it is discharged into waterways.

(iii) Agricultural runoff:-

Agricultural runoff can be managed by using conservation practices, such as cover crops and buffer strips. These practices can help to keep pollutants from washing into waterways.

(iii) Businesses sustainable practices:-

Businesses should use more sustainable practices, such as composting food waste, instead of sending it to a landfill.

(iv) Sewage treatment:-

Sewage treatment plants should use aeration to add oxygen to the water, which helps to break down oxygen demanding wastes more quickly.

(v) Industrial waste water treatment:-

Industries should use on-site wastewater treatment systems to reduce the amount

of waste that is discharged into waterways.

(iv) Individuals Contribution:-

Individuals must also reduce their own contribution to oxygen-demanding wastes by composting food wastes, using less fertilizer, and disposing of household hazardous waste properly.

3 sides for a 5 mark question
Add diagrams where required
Instead of paragraphs, include points