

TOOBA GUL
GSA TEST: 2

Q No. 3

a-

What are the effects of Global warming on Pakistan? --

1. GLOBAL WARMING:

Global warming is a global problem. It causes climate patterns to change. It is instigated by human activities. Moreover, it is perceived threat to the environment.

a-Definition:

"Global warming is an average and gradual rise in the temperature of Earth's atmosphere."

— IPCC

2- EFFECTS OF GLOBAL WARMING ON PAKISTAN:

Pakistan is a country severely

affected by global warming despite less than 1% contribution in carbon emissions. These are far reaching effects of global warming on Pakistan, including:

- i- Social effects
- ii- Economic effects
- iii- Political effects
- iv- Environmental effects

a- Social Effects:

- 1- International environmental Refugee problem:

Rise in temperature triggers displacement and worsen living conditions of people. Rising heat and inavailability of drinking water make people in Pakistan to migrate to the other areas.

b- Economic Effects

- 1- Damage to the infrastructure:

Climate-related disasters damage infrastructure, disrupting economic activities.

e.g., Pakistan's economy is facing significant challenges due to climate change, with estimated loss of 2-5% of GDP annually.

C- Environmental Effects:

1. Rise in sea levels:

Global warming contributes to urban flooding. Consequently, there is a rapid rise in sea levels.

e.g., In 2020, urban flooding in Karachi led people to migrate to the other cities.

2. Melting of glaciers:

Human activities, especially industrialization emit CO_2 and greenhouse gas emissions in the atmosphere. As a result, glaciers are melting rapidly in Pakistan due to high temperatures.

Example, Chitaboo Glacier in Chitral has retreated rapidly in recent years due to global warming.

3. Eruption of wildfires:

Due to the burning of forests,

the amount of greenhouse gases emitted into the atmosphere by forest fires increases rapidly.

Example: wheat yield in South Asian countries, including Pakistan is feared to decline by 16% by 2080 due to climate change (CIMMYT, 2023).

d- Political Effects:

1- Rising conflicts:

Studies reveal that there are strong links between climate change and conflict. Conflicts fuel global warming and precipitation patterns of the country

Example: Indus water Treaty between Pakistan and India excludes environmental impacts on Pakistan.

3- SUGGESTIONS TO CURB GLOBAL WARMING:

Global warming can be mitigated by following measures in Pakistan.

a. Promotion of sustainable transport:

Pakistan needs to adopt the cycling like Japan and China. In Denmark more than 60% people rely on recycling.

b. Increase forest cover:

Pakistan need to minimize deforestation, and foster afforestation and reforestation.

Mayawaki (Japanese technique) is preferred for this purpose.

c. Resilient Infrastructure

Ensuring the climate change resilience of infrastructure will help to protect lives.

Q No. 3

(c)

Explain strata and function of Atmosphere

1- ATMOSPHERE:

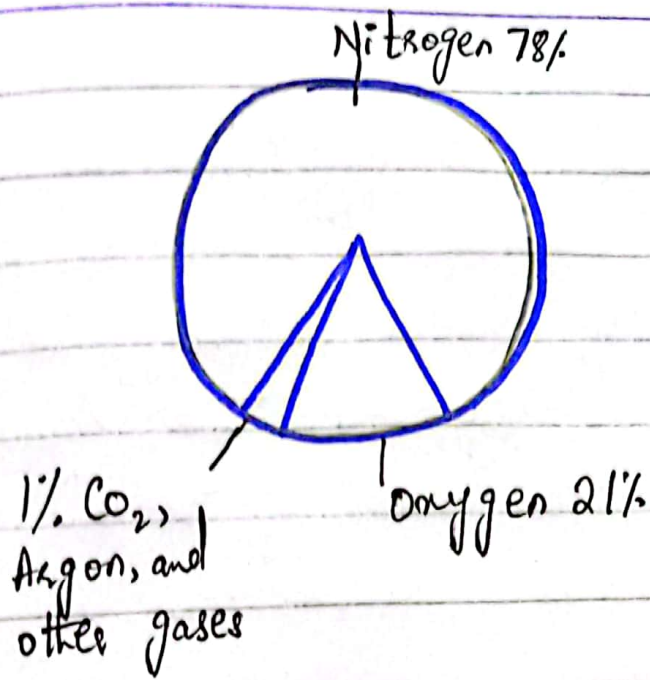
Air is a mixture of gases. Besides gases, there are varying amounts of water vapour in the air. The amount of water vapours in air vary from place to place and time to time.

Definition:

"The envelope of gases and water vapours surrounding the planet Earth is called Atmosphere."

2. COMPOSITION OF ATMOSPHERE:

Atmosphere is a mixture of multiple gases, including Nitrogen, Oxygen, Carbon dioxide and other gases.



COMPOSITION OF ATMOSPHERE

3- STRATA AND FUNCTION OF ATMOSPHERE:

The Atmosphere is divided into four

layers:

- i- Troposphere
- ii- Stratosphere
- iii- Mesosphere
- iv- Thermosphere

Thermosphere is further divided into

- i- Ionosphere
- ii- Exosphere

Each layer has its own chemical composition and functions in the atmosphere.

i- The Troposphere:

Tropo means "turning" or "changing". It extended to about 12 Km in the atmosphere. The atmospheric layer close to the Earth is called Troposphere. This layer contains most of the mass of the atmosphere.

Functions:

- a- It is the layer in which we live.
- b- Dust particles and water vapours are formed in the troposphere.
- c- Weather occurs in this layer.
- d- Clouds are formed in this layer.
- e- Aircrafts fly in troposphere.

As altitude increases in troposphere, temperature decreases from 17°C to -56°C .

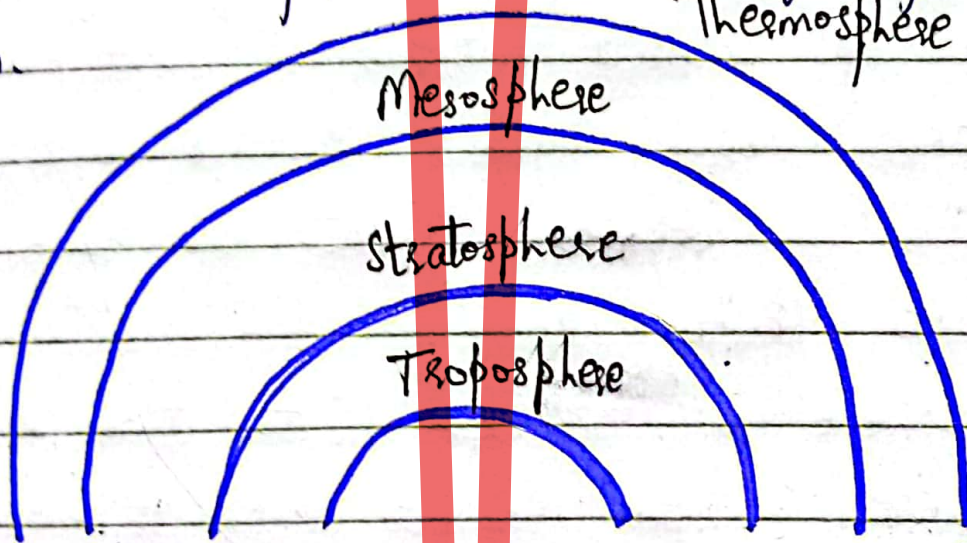
ii- The Stratosphere:

The second layer as one moves upward from the Earth's surface is called **stratosphere**. The stratosphere extends from the top of troposphere to about 50km.

above earth's surface. Temperature in this layer varies from -55°C to -5°C .

Functions:

- a- Stratosphere contains little water vapours.
- b- It contains maximum amount of ozone and is responsible for rise in temperature of stratosphere.
- c- This ozone layer protects living things from harmful ultraviolet rays from the sun.



Layers of Atmosphere

iii- The Mesosphere:

"Meso" means "middle", so the mesosphere is the middle layer of the atmosphere.

It extends from top of stratosphere to about 80km from the Earth's surface. In outer mesosphere, temperature approaches to 93°C .

Function:

- i- Mesosphere protects Earth's surface from being hit by most meteoroids.

iv- Thermosphere:

The outer-most layer of the Earth's atmosphere is called thermosphere. It extends from 80km above Earth's surface outward into space. "Thermo" means heat. This layer is hot upto ~~1800~~ 1800°C .

Thermosphere is divided into two layers

- a- Ionosphere is the lower layer. It extends 80 to 400km above the surface of Earth.
- b- Exosphere is the outer layer. It extends to 400km to thousands of kilometers on Earth's surface.

d-

what swm? ---

1- SOLID WASTE MANAGEMENT:

"Solid waste management is a supervised handling of waste from its generation points through the recovery process upto the disposal."

i- Explanation:

The technique to dispose the solid waste of industries and home in such a way that minimizes the risk of adverse impact on human beings, plants and aquatic life.

2- APPROACHES TO SOLID WASTE MANAGEMENT:

Solid waste management comprises of following stages.

i- Collection stage is the most costly part. Government is responsible for collection

of waste.

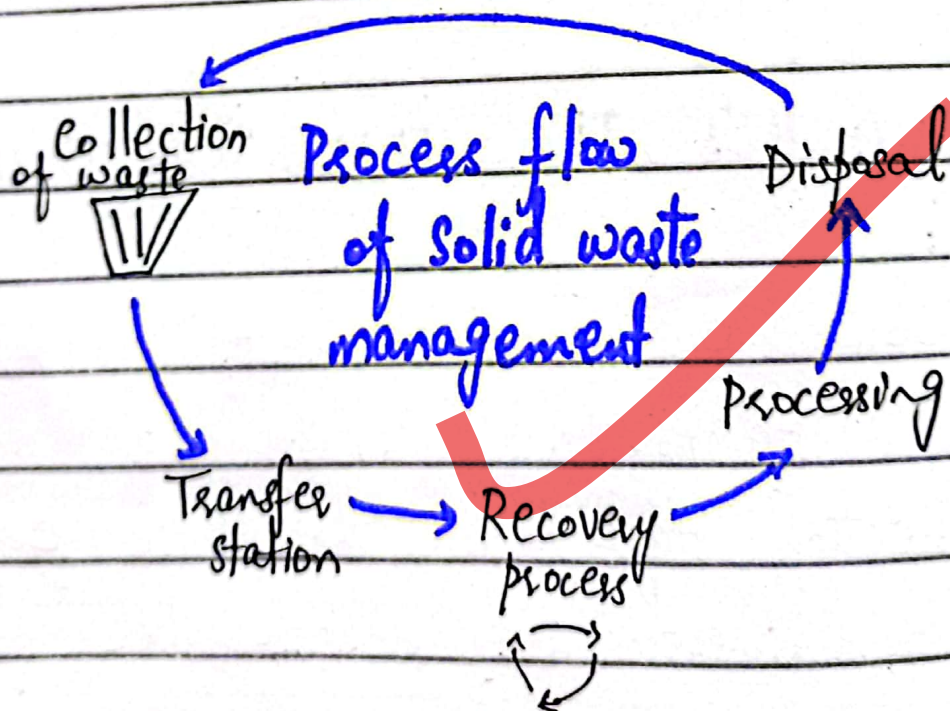
ii- Recovery Process:

Transfer station is central to the recovery process. It is a centralized facility which is present in the centre of city.

iii- Waste disposal:

Disposal of waste is done by following techniques:

- a- Open dumping
- b- Composting
- c- Incineration
- d- Landfilling



3- DISPOSAL METHODS IN SOLID WASTE MANAGEMENT:

There are four disposal methods in solid waste management:

i- Open Dumping:

In open dumping, open deposition of waste in the surrounding of cities. It is an unsustainable technique.

Rio Declaration 1992 discouraged open dumping.

ii- Incineration:

Incineration is about combustion of waste. In this method waste is burned at high temperatures (typically $800-1200^{\circ}\text{C}$) in a controlled environment.

iii- Landfilling:

In landfilling waste is buried in a designated area. Landfills produce methane as waste decomposes.

iv - Composting:

Composting is a controlled biological process for decomposition of organic waste. In this process microorganisms breakdown organic matter into a nutrient-rich soil. This has three stages

a - Mesophilic composting uses mesophilic bacteria for decomposition of waste.

b - Thermophilic phase uses thermophilic bacteria.

c - Maturation phase converts organic waste into compost (biofertilizer).

Q. No. 1

C-

Define optic. fibres---

1. OPTICAL FIBRES:

"Optical fibre is a thin & flexible fibre with a glass core through which light signals cannot ~~per~~ be sent with very little loss of strength and transmit more data over longer distances faster than other mediums."

2. STRUCTURE OF OPTICAL FIBRE:

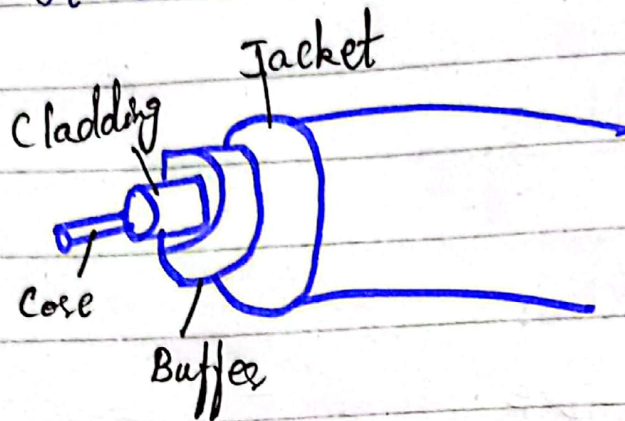
Structurally, optical fibre consists of:

Core: Thin glass center of fiber where light travels. The core has the diameter of $10\mu\text{m} - 200\mu\text{m}$.

Cladding: Plastic outer optical material surrounded by core. The refractive index of cladding is less than that of the core.

Buffer: A polymer layer surrounded by cladding.

Jacket: It coats the whole optical fiber.



Optical fiber

3- IMPORTANCE OF OPTICAL FIBRE:

Optical fiber is crucial for modern communication due to its ability to transmit massive amounts of data over long distances.

i- Immunity to electromagnetic interference.

It is immune to electromagnetic interference, ~~has~~ ^{possesses} high speed internet and advanced applications.

ii- Automotive in nature.

~~It~~ Optical fiber has interior and exterior lightning and sensor systems.

iii- Global connectivity.

Optical fibres link continents

through undersea cables.

iv- medical endoscopy and imaging.

Q.1

a-

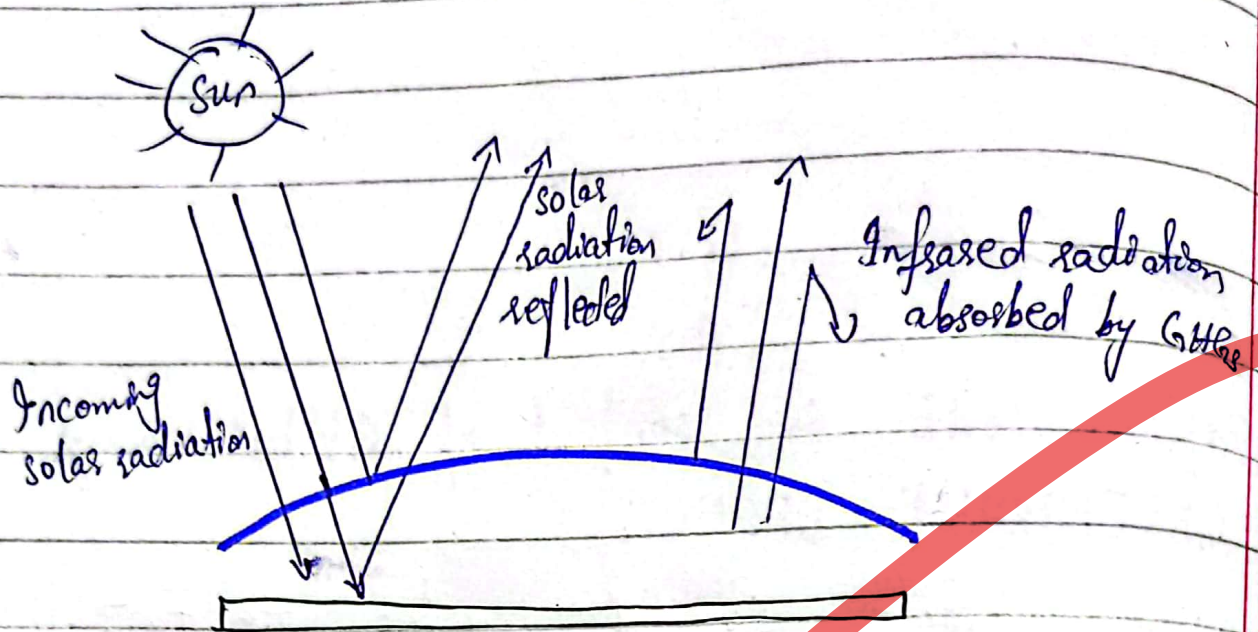
Explain GHE in content of Global warming.

1. GREENHOUSE EFFECT:

When sunlight reaches the Earth's surface, it can either be reflected or back into space or absorbed by Earth. Once absorbed, the planet releases some of the energy back into the atmosphere as heat.

Greenhouse gases (GHGs) like water vapour (H_2O), Carbon dioxide (CO_2), and methane (CH_4) absorb energy, slowly or preventing the loss of heat to space. In this way, GHGs act like a blanket, making Earth warmer than it would otherwise be. This process is called "greenhouse effect."

GREEN HOUSE EFFECT



2- Explanation:

Without greenhouse gases heat energy absorbed and reflected from Earth's surface would easily radiate back out to space, leaving the planet with a temperature close to -19°C . Since Industrial Revolution began around 1750, humans have contributed to climate change by adding CO_2 and other heat-trapping gases into the atmosphere.

3- CONCLUSION:

Global warming is the root cause of Greenhouse effect. Due to this effect Earth's climate is

seriously affected.

Q.1.
d.

define water pollution --

1. WATER POLLUTION:

"Water pollution is the contamination of water bodies by harmful substances from sources like industrial discharge to the agricultural runoff."

Water pollution is caused when water bodies such as rivers, lakes, oceans and aquifers get contaminated with industrial and agricultural wastes.

2. TYPES OF WATER POLLUTION:

There are several types of water pollution. These are

a - Chemical pollution:

This includes heavy metals, pesticides and industrial chemicals.

b - Surface water pollution:

It is the contamination of rivers, lakes and oceans.

c - Groundwater pollution:

Groundwater pollution includes seeping into underground aquifers.

d - Nutrient pollution:

Excess nitrogen and phosphorus from fertilizers.

3- SOURCES OF WATER POLLUTION:

i - Industrial waste:

Toxic chemicals, heavy metals

ii - Agricultural Runoff:

Fertilizers, pesticides and animal manure

iii - Marine dumping: Plastic and other solid waste into oceans

4- CONTROLLING MEASURES:

- i - ~~Proper~~ Proper treatment of sewage
 - ii - Sustainable agriculture
 - iii - Improved waste management.
-

Q.1.

b.

What are vitamins? Types, functions, sources and deficiency.

1- VITAMINS:

Vitamins are organic compounds needed in small quantities for bodily functions, growth and preventing deficiency diseases.

2- TYPES OF VITAMINS:

Two types of vitamins are

- i- Fat-soluble vitamins
- ii- Water-soluble vitamins

Vitamin	Function	Source	Deficiency
A	Vision	Liver, milk	Might blind
D	Bone health	Sunlight	Rickets
E	Protect cells	Leaf Oil	Muscles weaken