Nowal Ashraf
Environmental Science

QNo.2 (A)

1. Introduction

Industrial Revolution started in sixteenth century in Great Britain and continously going towards sophistication till date. Industrial Revolution paved the way towards socio-economic progress in the world — use of iron and steel, establishment of industries, increased productivity, connectedness, increased per capita income, transformation from agrarian to industrial society, improved living conditions. Along with all these benefits it results in many environmental consequences such as air and land pollution, Smog, waste management, deterioration of air and water quality.

good

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2. Industrial Revolution Paved the way towards socio-economic progress in the world:

Industrial Revolution paved the way of progress in the world. Many development are;

2.1. Use Of Iron and steel and formation of heavy machinery:

Industrial revolution started the use of steel and iron in formation of heavy machinary for industries.

2.2:- Transformation of Agrarian economy to Industrial Economy:

After the establishment of Industrial units the agrarian economies shifted towards industrial economies.

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2.3 :- Increased Productivity and Efficiency :

Due to machinery and industries the increase in productivity was observed also the efficiency also increased- more and speedy products in less time with low resources.

2.4 :- Increase in Per Capita Income and creation of Job opportunities :

this is not asked
this is just for the sake of understanding
no need to explain this part

The implantation of ~~industrial units~~ created too much job opportunities and increased the per capita income of person creating well-being of the nation- improving the living conditions.

3. Environmental Consequences of Industrial Revolution :

Industrial revolution better the economic and living

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conditions but deteriorated environmental quality.

3.1. Air and Land Pollution was increased.

Industries incorporated too much in carbon emissions out of industrial chimeneys and automobil exhaust. Industrial waste incorporated land and air pollution.

3.2.- Enhanced Greehouse Effect and global warming leading to climate change:

Emission of green house gases such as CO_2, CH_4 and N_2O from industries and automobile increased greenhouse effect and trapping of solar heat resulting in global warming and green house effect and climate change.

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3.3 :- Creation of Smog in London city :

Industrial units created smog disaster in the London city deteriorating air quality leading to breathing health issues.

3.4 :- Waste management Issue.

Industrial revolution increased the amount of waste along with products and inadequate waste management techniques resulted in waste management issues leading to air, land and water pollution.

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there is no data of before and after stats of ind rev how it has impacted etc ans is very generic and below average

4. Conclusion :-

Industrial revolution succeeded in upgrading living standards but along with came many problems such as smog, air, land and water pollution effecting the health of humans.

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Q.No2. B.

1: Introduction:

Pakistan is witnessing bad air quality index in major cities like Multan and Lahore. Many factors are incorporating in bad air quality such as smoke from industries and automobile exhaust, un-sustainable use of hydrocarbons, burning the residual of crops. These factors and problems can be mitigated by sustainable use of hydrocarbons, alternative clean renewable energy sources, use of catalytic convertor in automobiles and zig-zag technology in industries.

2: Bad Air Quality Index in Major Cities of Pakistan:

Pakistan is facing

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high change in air quality Index since last few years. Bad air quality is causing smog issues in many cities just like Lahore and Karachi.

AQI data?

UN report;

"Lahore is at the top of most polluted cities in the world in October-2024."

Lahore and Multan were most effected cities of Punjab province.

Air Quality Index (Lahore) < 2000

3. Underlying Factors behind bad air quality:

Some major factors influencing air quality are;

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3.1. Emissions from Industries and automobiles:

Emissions of carbon oxides (CO_x), nitroge oxides (NO_x) and sulphur oxides (SO_x) incorporating towards bad air quality index.

3.2 :- Unsustainable use of Hydrocarbons.

In Pakistan no check and balance on energy production Pakistan is using 65% hydrocarbon produced electricity. Hydro-carbons are un-sustainably used in industries, home and automobiles leading to carbon emissions.

3.3: Burning of Residues of Crops.

After harvesting the crops the residues are burnt. This burning emits carbon oxides effecting air quality.

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4: Way-outs to solve the bad air quality:

Here are some proposed way-out to improve air quality.

4.1: Sustainable use of Hydro-carbons.

Sustainable use of hydrocarbons can reduce the bad air quality.

4.2: Alternative clean renewable energy resources consumption

Clean energy resources should be used as alternative to hydrocarbons. Some renewable clean energy resources are:

* Solar Energy
* Wind Energy
* Hydro-power
* geo-thermal Energy
* Bio fuels (Bio diesel, bio-gas)

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4.3: Use Of Catalytic Convertor in automobiles:

catalytic convertor should be used in automobile to convert harmful exhaust gases into less harmful gases. Use of High-octane fuel can also lower the emissions.

4.4: Use of zig-zag technology in industries to reduce emissions:

Government should made it mendatory to use zig-zag technologies in industrial chimneys to lower the harmful gases emission.

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5: Conclusion:

Pakistan is facing bad air quality but it can be mitigated by sustainable use of hydrocarbons, using clean

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QNO3 :-

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1: Introduction:

Climate generally refers to long-term changes in weather pattern. Climate can be studied at 3 different levels of global, regional and local. LA-NINA and EL-NINO are two phases caused by the temperature change over ocean surface. LA-NINA is cool phase and EL-NINO is warm phase.

2: What is Climate?

According to UN;

"Climate refers to long term changes in weather variables."

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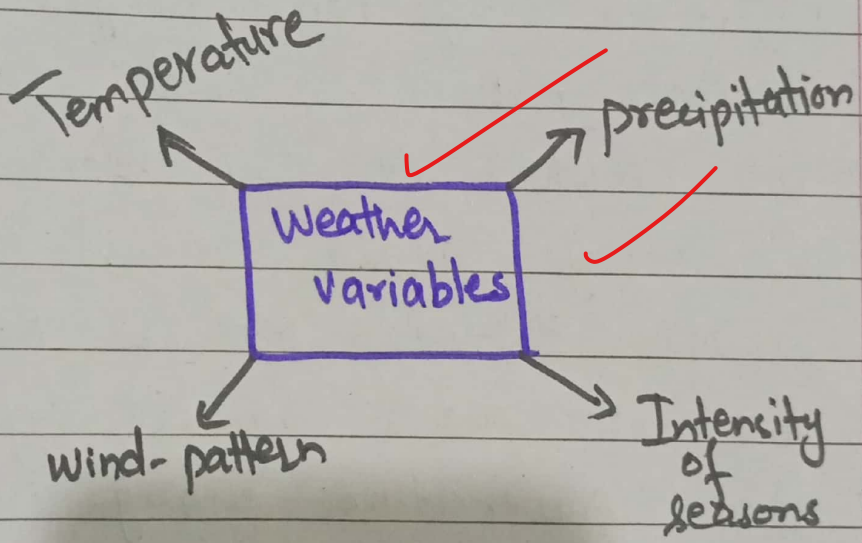
Generally it is change in weather patterns, precipitation and temperature.

3: List of Weather Variables:



4: Phenomenon of LA-NINA and EL-NINO in Context of Global climate:

LA-NINA and EL-NINO are the two climate phenomeno causing cool and warm phases.

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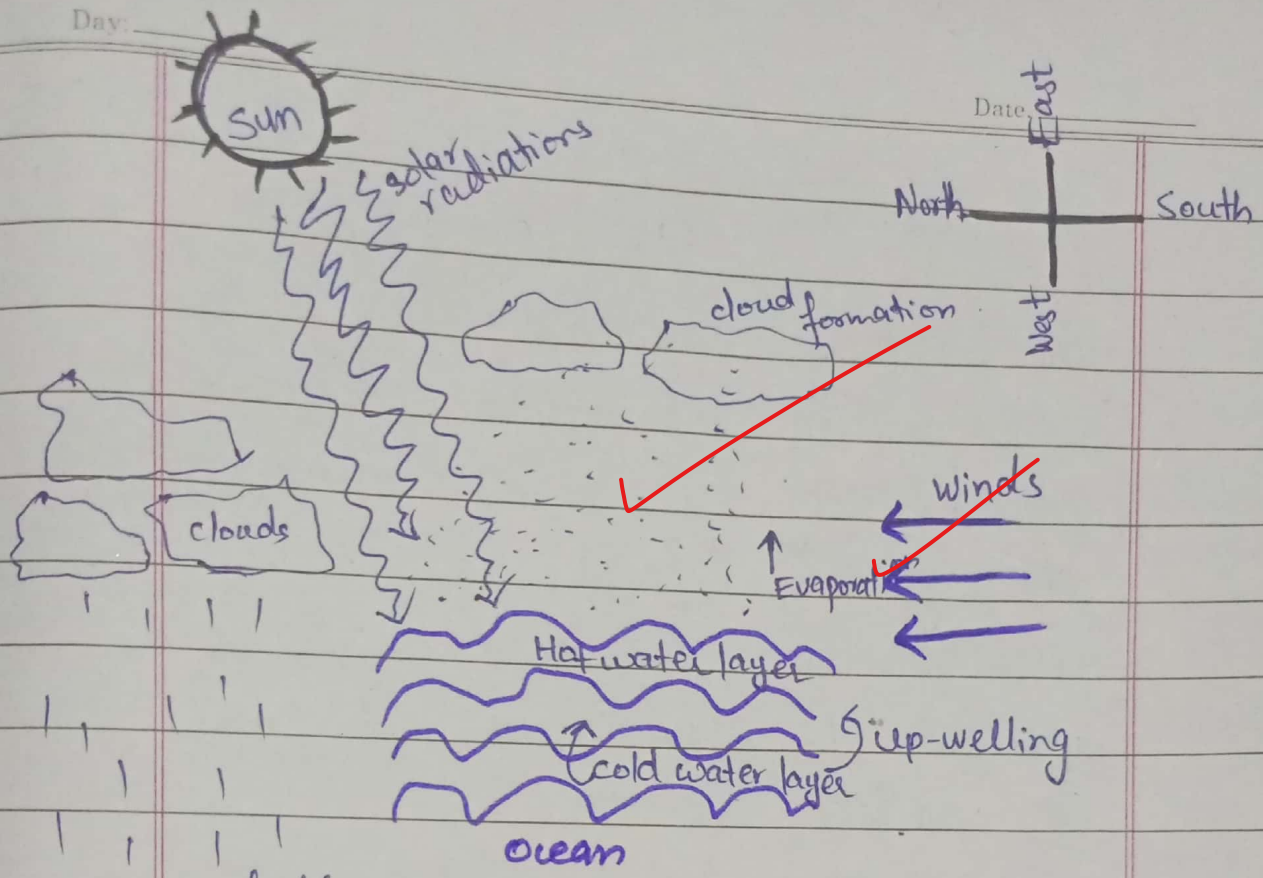

LA-NINA and EL-NINO

When solar radiations fall on the surface of oceanic water, water become hot and high kinetic energy molecules leave the surface and evaporate in the air. These water vapours forms clouds. Wind from the south carry these clouds towards north where precipitation occurs — it is cooling phenomenon LA-NINA, While the region where hot winds came shows the phenomenon of EL-NINO-hot phase.

5: Conclusion:-

Climate is change in weather variables such as wind pattern, precipitation, temperature and intensity of seasons. Climate at global level has two phenomenons the cold phase is called LA-NINA and hot phase is called EL-NINO.

B

1: Introduction:

Eutrophication is enrichment of water resources with salts which promotes the growth of Algae and consumes oxygen dissolved in water. It's process started when nutrients like nitrates and phosphate are added to water it promotes growth of algae. Dead

diagram here.

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algae consumes oxygen. Eutrophication deteriorates the quality of water, making it unfit for drinking and domestic use. It destroys the aesthetics of water bodies. It is harmful for the aquatic life. However, eutrophication can be controlled with waste water treatment, avoiding salts and nutrients mixing in water bodies.

2 :- What is Eutrophication?

"Eutrophication is actually the deterioration of water quality due to enrichment of water with phospate and nitrate salts."

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3: Proces of Eutrophication:

The main reason behind the eutrophication is the addition of waste water from homes and industries into nearby water bodies.

This waste water contains many organic compounds, heavy metals and inorganic salts such as phosphate and nitrates. These salt promotes the growth of algae in the water. The dead algae required oxygen when it is decomposed by bacteria hence using the dissolved oxygen of water. Shortage of oxygen results in death of aquatic life and decomposition of algae deteriorates water quality and release bad smell.

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4: Effects of Eutrophication:

* Eutrophication may results in following effects;

* It deteriorates the water quality.

* It makes water unfit for drinking and using for domestic purpose.

* It destroys the aesthetic beauty of water bodies.

* It causes smell near the water body.

* Lack of dissolved oxygen in the water leads to death of aquatic life.

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5: Controlling Measures for Eu-trophication:

Eu-trophication can be controlled by adopting following measures;

5.1:- Waste-water treatment:

Eutrophication can be avoided if waste-water from homes and industries are treated in plants and then added to water bodies.

5.2:- Avoid desposing waste water in nearby water bodies:

By avoiding waste water of industries, which is enriched in nutrient, adding into nearby aquatic bodies the menace of eutrophication can be resolved.

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6: Conclusion:

Eutrophication is nutrients enrichment of water due to addition of waste water into water bodies. The only solution to avoid eutrophication is to avoid adding waste water in water-bodies.

QNO. 5

A

1: Introduction:

- EIA stands for Environmental Impact Assessment. It is a project based technique which is used to identify, reduce and mitigate the effects of any project on the environment. Proces of

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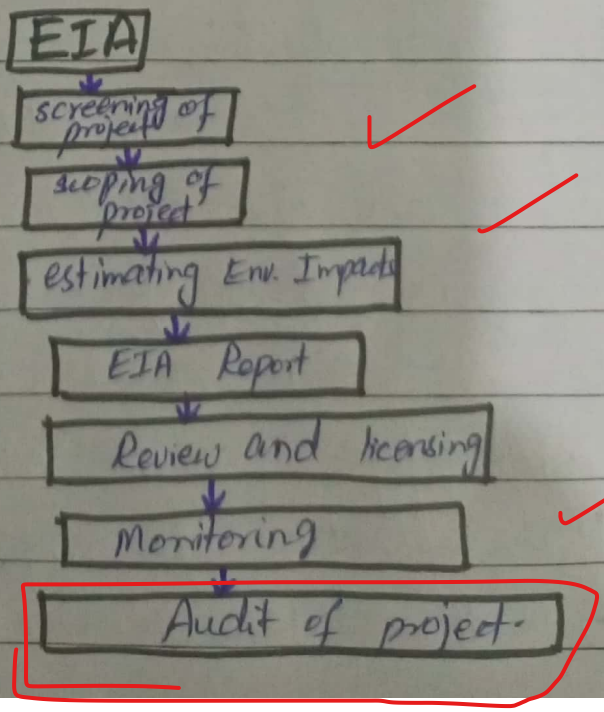
EIA includes seven major steps such as scoping, screening, impact prediction, EIA report, review and licensing, monitoring and audit of project. And it is very important for environment protection it estimates the effects of any project on environment and ecosystem.

2: Process of EIA:

Environmental impact assessment process consists of seven steps.



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2.1: Screening of Project:

The first step in EIA is the screening of project - what is project? where it is, its size and Location. Project can be highway, railway, bridge, school or building.

2.2: Scoping of Project:

Second step of project is scoping. The investigation of site, nearby flora and fauna - biodiversity, any water body or forest.

2.3: Estimating Environmental Impacts:

Next step is estimating the impacts of project on land, bio-diversity, flora and fauna and specially on environment. Positive impacts of project such as job opportunities and capital creation also considered.

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2.4: EIA Report:

Then all of the above observations and estimations and suggestions to mitigate negative effects of project are brought down on a report called EIA Report.

2.5: Review of Report and licensing:

Then EIA repost is reviewed and license is issued if satisfactory measures are taken to mitigate environmental impacts.

2.6: Monitoring During Project:

When license is Issued, the project is started but government continouse its monitoring.

2.7: Audit After Completion of Project:

When project is ~~clean~~ completed the audit is conduted to check its impacts on environment.

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3: Case-study:

A case study of EIA is here.

I Project name : Hydro-power Project
II Countary : Hundarus
III Category : 2, 3, 4
IV EIA Report : {scope, impacts, mitigation strategies}
V. Project monitoring :
VI and Audit. :

4: Importance of EIA:

EIA casts important steps in environment protection.

I It is necessary to estimate the impacts of any project on environment.

II It is helpful in environment protection and bio-diversity conservation threatned by any project.

III The monitoring of project ensures the implimentation in environment

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indicators.

IV Audit of project after its completion bound the owner to not violate environmental policies and mitigation practices.

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5. Conclusion:

Environmental Impact assessment consists of seven steps to estimate the impacts of a project on environment and mitigating measures.

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B

1. Introduction:

Science can be instrumental in controlling pollution. Many scientific methods are used to controll pollution like that of wet scrubbing method, bag method, adsorption method,

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chemical method, bag house, zig zag technique, catalytic convertor, biological control, composting and many more.

Q: Science Is Instrumental In Managing pollution:

Science is revolutionizing our daily lives but it also created many environmental problems since the industrial revolution. But science can be used to combat these environmental issues. Following three types of Methods are used to manage pollution.

I Physical Methods
II Chemical Methods
III Biological Methods.

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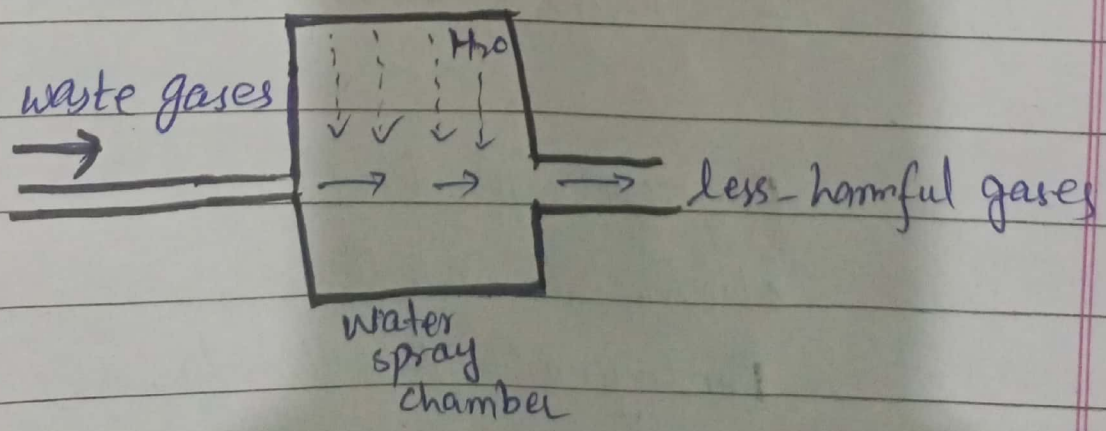
3: Scientific Methods Employed to control pollution:

Some physical, chemical and biological method of pollution control are discussed here:

3.1: Wet-scrubbing Method

Waste gases from industrial exhaust are passed through chamber where water is sprayed on them. water soluble pollutants such as SO_x are dissolved in water and gases are allowed to enter in air.



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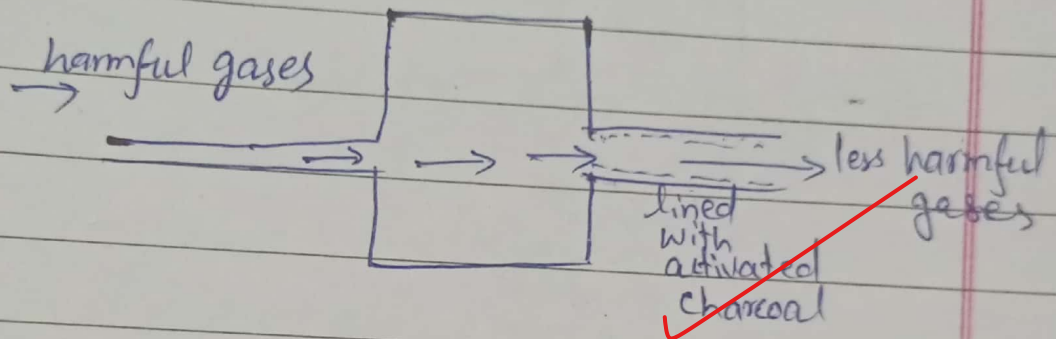
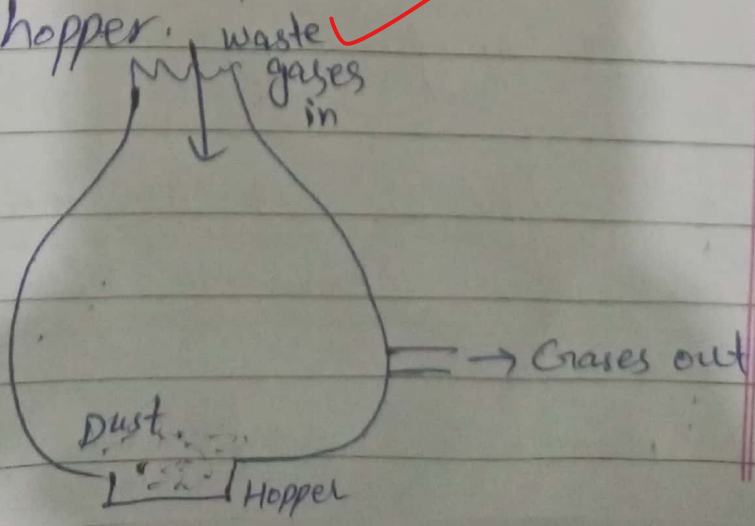
3.2 :- Adsorption Method:

In this method waste gase are passed from chambers which are lined with adsorbants such as activated charcoal which adsorbs harmful gases.



3.3 : Bag-house Method:

In this physical method waste gases enter into clothing bag and waste solid dust particles are collected in hopper.



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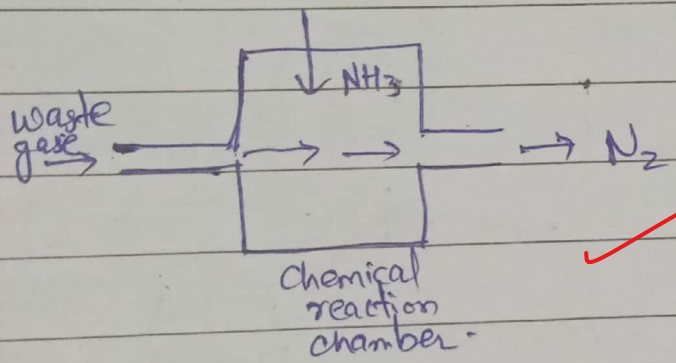
3.4:- Chemical Method:

In chemical method NH_3 gases is sprayed in a chamber which reacts with waste exhaust gases and convert them into nitrogen gas.



3.5: Cotton Curtain Method:

Waste gases are allowed to enter in a chamber completely lined with cotton curtains - which traps dust particles and exit the less harmful gases.

3.6:- Use of Zig-zag Technology in the chimneys of industries

Another scientific method to

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controll pollution is use of zig zag technology in industries and kilns. They trap dust and smoke and make exhaust less harmfull.

3.7. Composting

This biological method employs micro-organisms to turn waste into useful products. Bacteria like Bacillus and aspergillus or E. coli are used in this technique.

Required conditions are.

PH : 7 – 8

Temperature: 15° – 40° C

C : N = 30 : 1

At the end compost is formed by thermophilic or mesophilic bacteria which is then used as manure and organic fertilizer.

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3.8:- Catalytic Converters in automobiles :

Science enabled us to use catalytic converter and high octane fuel in automobiles it will reduce the emissions of harmful gases.

Conclusion :-

Science is instrumental in pollution control. Composting, catalyting convertor, beg-house method, chemical method, wet scrubbing and adsorption methods are used to control pollution.

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Q NO. 6

A

1: Introduction:

Bio-diversity loss refers to the loss of variety of flora and fauna in the ecosystem. Some major causes of bio-diversity loss are deforestation, desertification, urbanization, over-exploitation, climate change, global warming and unsustainable development and agriculture. Convention on Biodiversity is an agreement to conserve bio-diversity in the region and stop extinction of endangered species.

there is a clear issue of time management need diagrams and flow charts with data and statistics to substantiate your argument concluded the and 20 marks ans on 8th side max to achieve 4 q goals need improvement as answers are average

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2: What is bio-diversity loss:

Bio-diversity refers to variety of life and bio-diversity means the decrease in the variety of living organism in ecosystem.

3: Causes of Bio-diversity Loss:

Some major causes of biodiversity loss are;

I Deforestation - destroying the habitate of many species.

II Desertification also destroys many species's habitate. UN says 7.2 billion living things are being effected by desertification.

III Over-exploitation of bio-diversity

such as over-hunting and fishing leading to bio-diversity loss.

V Unsustainable urbanization

V Climate change and global warming effecting bio-diversity.

VI Unsustainable development and agricultural practices effects bio-diversity loss.

4: Convention On Bio-Diversity:

Convention on Biodiversity is a product of Earth summit 1992.

On this convention certain strategies and techniques were employed by the signing countries to combat bio-diversity loss.