

Indraprastha Institute of Information Technology

Mid Semester Examination (October 08, 2024)

ESC 205A Environment Science

MM 20

Time 1 Hr.

Attempt all the questions

1. Describe the environmental condition of air pollution in Delhi from October to December during the last 2-3 years. What are its effects on human health due to the same ?

Air quality index of Delhi is generally in the Good (0–50), Satisfactory (51–100), and Moderate (101–200) levels between March and September, and then it drastically deteriorates to Poor (201–300), Severe (301–400), or Hazardous (401–500+) levels during October to February due to various factors including burning of crackers during Diwali.

The wind speeds are slow during this time and thus the polluted air stays in the capital for the longest time. Air Quality Index (AQI) of Delhi deteriorates due to the constant pollution from transport, dust, industrial and episodic sources including firecrackers and stubble burning.

2. Describe at least 5 diseases caused to human which may be attributed as due to the air pollution.

List Of 10 Common Diseases Caused By Air Pollution

Cardiovascular Diseases.

Cancer.

Neurological Disorders.

Gastrointestinal Disorders.

Kidney Diseases.

Liver Diseases.

Skin Diseases.

Asthma etc.

A few lines on the diseases may also be given

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2

3. Describe what are the following :

(a). Different ranks of coal

Ranks of coals :

Lignite or Brown coal –

Lowest rank coal it is present

Found in India in TN, Rajasthan, Gujarat etc.....

Bituminous coal – Medium rank coal. Main type of coal- coking and non coking

Anthracite - Highest Rank coal, Less volatile matter. This can be used to make carboelectrodes ...

(b).Secondary air pollutants with examples

Secondary pollutants, which are produced in the atmosphere when certain chemical reactions take place among primary pollutants.

Peroxyacyl nitrates (PAN) are a family of compounds which result from photochemical reactions between contaminants released to the atmosphere by combustion of organic fuels. Peroxyacetyl nitrate (PAN) is the most abundant member of this family and is responsible for serious plant injury in some polluted areas.

Atmospheric sulfuric acid is another example of a secondary pollutant.

Dioxins, heavy metals , acid oxides, aldehydes etc. are other secondary

(c). Line source of pollution with examples.

Line source- The most prominent linear sources are roadway air pollution, aircraft air emissions, roadway noise etc.

Line source means a one-dimensional source. An example of a line source is the particular emissions from a dirt road.

(d). Dioxins and their generation

Dioxins are a group of chemically related compounds, and they are persistent in the environment. This group includes polychlorinated dibenzo para dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs).

These are formed by the combustion of mostly chlorinated compounds such as black liquor, PVC, municipal waste etc.

2

4. Write short notes on the following topics :

(a).Desertification

Desertification is a process whereby the productive potential of arid or semiarid (receiving less rains) lands falls by ten percent or more.

Severe desertification results in more than 50% drop in productivity and usually creates huge gullies and sand dunes.

Desertification leads to the conversion of rangelands i.e., grasslands or irrigated croplands to desert like conditions in which agricultural productivity falls.

Desertification is characterized by devegetation and loss of vegetal cover, depletion of groundwater, salinization and severe soil erosion.

(b). In - situ conservation of biodiversity

In situ conservation (within habitat): This is achieved by protection of wild flora and fauna in nature itself. e.g. Biosphere Reserves,

National Parks, Sanctuaries, Reserve Forests etc.

(c). What is endemism? Describe some endemic species with examples

Species which are restricted only to a particular area are known as endemic. India shows a good number of endemic species.

About 62% of amphibians (frogs, toads, newts, salamanders etc.) and 50% of lizards are endemic to India.

Western ghats are the site of maximum endemism.

(d). Shannon-Wiener Index of biodiversity

The Shannon-Wiener Species Diversity Index is calculated by taking the number of each species, the proportion each species is of the total number of individuals, and sums the proportion times the natural log of the proportion for each species.

The Shannon-Wiener Diversity Index, H , is calculated using the following equation: $H = -\sum P_i (\ln P_i)$ where P_i is the proportion of each species in the sample. Given a very large sample size, with more than 5 species, the S-W index values (H) can range of 0 to ~ 4.6 using the natural log (\ln).

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5. Describe what is photovoltaic (PV) power generation with the help of a diagram.

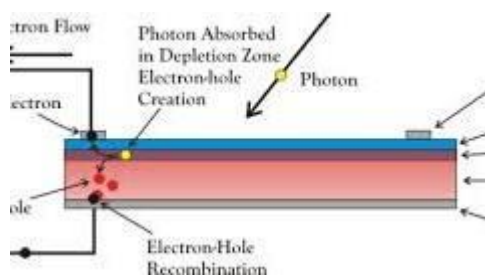
Photovoltaic cells/ Solar Cells :

They are also known as photovoltaic cells or PV cells. Solar cells are made of thin wafers of semiconductor materials like silicon. When solar radiations fall on them, a potential difference is produced which causes flow of electrons and produce electricity. – p-n junction.

Usually silicon is used in two layers, one layer being doped with boron, the other phosphorus. These layers have different chemical electric charges and subsequently both drive and direct the current of electrons.

Boron is a p-type dopant, other is Indium.

Phosphorus is n –type dopant., others – As, Sb.



6. What is biodiversity?

Biodiversity refers to the variety and variability among all groups of living organisms and the ecosystem complexes in which they occur.

Biodiversity is all the different kinds of life you'll find in one area—the variety of animals, plants, fungi, and even microorganisms like bacteria that make up our natural world. Each of these species and organisms work together in ecosystems, like an intricate web, to maintain balance and support life.

How is the extinction of cheetahs being remedied/ engineered in India.

India on Tuesday officially proposed the import of cheetahs from Kenya, even as 15 surviving animals brought from Namibia and South Africa continue to stay inside enclosures at Kuno National Park.

Modi ji has been taking lot of interest in this. Effort is being made that these cheetahs may get acclimatized to the Indian conditions by consuming the local preys being made available in the National Park.

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7. What is symbiosis? Give example of Antagonism.

Symbiosis is a term describing any relationship or interaction between two dissimilar organisms. The specific kind of symbiosis depends on whether either or both organisms benefit from the relationship.

Any relationship in which two species live closely together is called symbiosis. There are three main types of symbiosis: mutualism, commensalism, and parasitism.

Antagonism, in ecology, an association between organisms in which one benefits at the expense of the other. As life has evolved, natural selection has favoured organisms that are able to efficiently extract

energy and nutrients from their environment. Example
opposing action of insulin and glucagon to blood
sugar,. Mosquitoes and man.

This includes predation, or a predator eating prey.
Think of bears killing salmon. It also includes
parasitism, or one organism depending on (but not
killing) a host.