

PAPER

SOLUTION

Subject:

(winter 2010)

Environmental Studies

Class T.E. IT

**Q. A. Acid
01**

rain:

The term acid rain is used to describe all precipitation and/or deposition, which is more acidic than normal. It results when gaseous emissions of particularly Sox and Nox interact with water vapour and sunlight and are chemically converted to strong acidic compounds such as sulphuric, sulphurous, nitric and nitrous acids. These compounds along with other organic & inorganic chemicals are deposited on the earth & called as dry deposition and when these are carried by precipitation (raindrops, snow, fog or dew), the deposition is called wet deposition.

Or

When fossil fuels such as coal, oil, & natural gas are burned, chemicals like sulfur dioxide & nitrogen oxide are produced. These chemicals react with water and other chemicals in the air to form sulfuric acid, nitric acid and other harmful pollutants like sulfate and nitrates. These mixes with rain water are called as acid rain.

Acid rain is defined as the one which has a pH of 5.6, which is the natural background pH of rain water.

Effects:

01

Washes nutrients in soil

The acidification of streams & lakes affects aquatic animals & plants

Creating holes in waxy coating of leafs

Effects wildlife which result in distorted food chain

The building material weakened mechanically

Damaging effects like corrosion of metals, marbles etc.

**B.
02**

Bioprospecting

Biopiracy

1 Bioprospecting is search for biological resources and accompanying indigenous knowledge---primarily for the purpose of commercial exploitation

1 Biopiracy is the illegal appropriation of life ---microorganism's plants and animals (including humans) and the traditional cultural knowledge that accompanies it.

2 Bioprospecting identifies biological resources and traditional knowledge with commercial potential

2 Biopiracy is appropriates these resources and knowledge without obtaining prior informed consent (PIC) or awarding just compensation

**C.
02**

Cyclone

mitigation:

They are large, revolving, vortices in the atmosphere extending horizontally from 150-1000km & vertically from the surface from 12-14km Avg.5-6 tropical cyclones form in Bay of Bengal & Arabian Sea.

Effects:

Winds very strong

Torrential rains

High storm tides

Effective mitigation policies:

Installation of early warning systems

Developing communication infrastructure

Developing shelter belts

Developing community cyclone shelters

Constructing of permanent houses

Training & education

Land use control and settlement planning

**D. Fundamental principles of environment:
02**

Productive value of nature

Aesthetic / recreation value of nature

Option value of nature

**E.
02**

Nuclear fission

Nuclear fusion

- 1 Splitting of nucleus of the atom the resulting energy can be used for a variety of purposes
- 2 80% nuclear energy is released
- 3 Occurrence in nuclear reactor

- 1 Collecting of nucleus of the atom the resulting energy can be used for variety of purpose
- 2 1 % nuclear energy is released
- 3 Occurrence on sun

02 F. Sustainable development:

Sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It includes social development & economic opportunity on the one hand, and the requirement of the environment on the other.

Sustainable development

Healthy Environment

Healthy People

Q.2 A. Women and child welfare in India:

05

In any community women & children constitute a priority group. They comprise approximately 70% of the population of the developing countries. In India this population is 62%; 22% women (between 15-44 yrs. Of age) and 40% children (under 15 yrs. Of age).

By improving the health of mothers & children, we contribute to the health of general population.

The problems affecting the women & child welfare are multifactorial. These include mainly lack of proper education, malnutrition, infections & unregulated fertility.

Malnutrition: Most people in the developing countries live under the burden of malnutrition. Previously it was thought that malnutrition is only concentrated in school children, but now it is realized that the prebirth period of life is also very important period from the nutrition standpoint. The adverse effect of malnutrition of women are maternal depletion, low birth weight, anaemia, all leading to high mortality & morbidity. Measures to improve the nutritional status is direct & indirect interventions. Which cover wide activities like supplementary feeding programmes, distribution of iron & folic acid tablets, nutrition education, control of communicable diseases, improvement of environmental sanitation, provision of clean drinking water, family planning etc.

Infections: Women & maternal infections can cause a variety of adverse effects such as threatened abortions, low birth weight etc. Women of under- developed nations are at high risk. They are usually infected with viruses especially during pregnancy. Also about 25% of women in rural area suffer at least one about of urinary infections.

Infection in the child begin with labour & delivery & increase as the child grows older. Children may be ill with diarrhoeal, respiratory & skin infections or by the chronic infections, such as ,malaria & tuberculosis. The children also suffer from anaemia. Prevention & treatment of infections in women & children is being done by adopting the WHO expanded Programme on Immunization. Women are being educated in medical measures such as oral rehydration & diarrhea.

Uncontrolled Reproduction: The severe health hazards for the women & children resulting from the uncontrolled reproduction are low birth weight babies, severe anaemia, abortion etc. The proper knowledge of the family planning guidelines can easily & appropriately control the ill effects of the uncontrolled reproduction.

Education & Socio-economic status: The dropout rate (from school) of girls is much higher than the boys. This problem is very much under control by making the female education free at the primary level by the several under developed nations. In India too the female literacy rate has gone upto 50% from 39.3%. Also certain income generating activities are created to improve the socio-economic status of women in rural as well as in urban areas.

Diseases regarding child and women's in India:

Gastrointestinal condition

Diarrhea

Measles

Malaria

Malnutrition

Uncontrolled reproduction

Education and socio economic status

Development regarding child and women's in India:

Balika samridhdhi Yojana

Indira Mahila Yojana

Mahila samridhdhi Yojana

Rashtriy Mahila kosh

Short homes for women's and girls

Integrated child development services(ICDS)

Balwadi Nutrition program

Early childhood education

Children act 1960in India(Amended in 1997)

B. Causes of global warming:

2 (1/2)

Green house gases: There are several gases in the earth's atmosphere, primarily water vapour and CO₂. Thus much of the earth's heat is retained which causes a warming effect. This phenomenon is known as green house effect and the gases that have the ability to absorb reflected long wave radiations & produce this effect are called green house gases. It is due to the natural occurrence of the green house effect(i.e. presence of water vapour & CO₂).

The green house gases are carbon dioxide, methane, and a number of other gases like N₂O, tropospheric ozone, chloro-fluro carbons, carbon tetrachlorides etc.

Industrialization

Population

Deforestation

Fossil fuel combustion

Effects of global warming:
2 (1/2)

Increase in global mean temperature at about 0.3°c per decade

Flooding of many coastal areas (lands and Iceland's)

Increase in water vapour in area

Increase in global average temperature will lead to dislocation of suitable land for agricultural

Increase in the severity of storms.

Increase in health problems

The dislocation & possible extension of certain biological species & ecosystems.

Q.3 A. Effect of water pollution:

05

Water pollution: “The presence of some foreign substances or impurities in water in such quantity so as to constitute a health hazard by lowering the water quality & making it unfit for use”.

Physical Effect: cooling water from power stations can cause rise in water temperature & bring about thermal pollution. Waste oil, fats & grease can enter water from several sources, which causes the reduction of water oxygen saturation.

Oxidation Effect: oxidation by the action of bacteria, chemical oxidation of other pollutants

Toxic chemical Effect: some organic & inorganic chemicals are toxic to plants, animals & humans. Pesticides pollution is due to the leachates from agricultural & horticultural land & from food processing plants. DDT one of the so many pesticides produces harmful effect over the body. Cyanides are very toxic to all biological life.

Chemical nutrients Effect: Chemical nutrients are required by plants & animals for maintaining their growth & metabolism. Nitrates & phosphates occur in water in small quantities. These are sufficient to maintain balanced biological growth. Phosphorous is required for the photosynthetic process in plants, for respiration & the production of nuclear DNA. Nitrates are taken into body by food & drink & excess will cause blood diseases & gastric cancer.

Microorganism Effect: Bacteria are responsible for cholera, typhoid fever, dysentery, virus may cause infective hepatitis & consackil fever, round worm, tape worms may also cause diseases.

Radio-nuclide Effect: Radioactive wastes to be disposed of into the environment may cause health hazards.

B. Role of I.T. in Environment management:

05

Biodiversity conservation: Use of GIS (Geographic Information System) & remote sensing can help in determining the rates, causes & scale of biodiversity loss.

Species monitoring: The International Union of Conservation of Nature & Natural resources(IUCN) maintains a Red Database at the World Conservation Monitoring Centre(WCMC) in which information on endangered & vulnerable species of plants & animals is kept.

Site selection: GIS can help in the selection of optimum highway or railway routes, dam or reservoir sites, waste disposal sites, major industrial sites etc. that can cause minimal disturbance to ecosystems.

Disaster management: Remote sensing data can be effectively used for obtaining near real time information on areas affected by earthquakes, cyclones, floods, landslides, volcanic eruptions, forest fires & other such disasters.

Soil resources: Satellite data provides valuable information on physiography, which helps map the spatial distribution of soil units with limited field work. These maps depict the nature of problem, degree of salinity, sodicity etc.

Water resources: Remote sensing data proved effective in inventorying, monitoring & managing both surface & ground water resources to augment the water use efficiency.

Role of I.T. in Human Health:

Bioinformatics & Osteoporosis: Bioinformatics is focused on gene diseases as well as drug target association.

Role in genome sequencing: James Kent produce a computer program that help to complete the sequencing in time.

DNA databases or data banks having generic information about populations together with their personal physical characteristics(eye colour, height, weight etc.), finger prints, dental records, medical records etc. are used by the Government Departments to identify missing persons, by the investigating agencies(e.g. FBI, RAW, CBI etc.)

Many organizations such as WHO maintain their websites with disease information to inform people about dangers involving populations.

Information about new drug release, their mode of action, indications & risks are also available on the websites.

Any new development in the field of surgery is also available on net to be referred by the doctors of any country at any time.

Telemedicine and distance medicine is now far reaching with documentation & display of human anatomy with the help of internet.

Q. 4 A. Public awareness about environment:

05

We can play major role in environment management

We can reduce wastages of natural resources and we can act as watchdogs that inform the government about sources that lead to pollution and degradation of the environment.

Public awareness medium: - mass media, newspaper, radio, & TV strongly influence public opinion.

Politicians in democracy always respond positively to a strong publically supported movement

NGO make influence politicians to make green policies

Various activities from student, people.

Soil
05

erosion:

soil erosion is a natural process of detachment & removal of loosened soil materials by exogenetic process i.e. by water, wind, ice or gravity. In other words the erosion is the wearing away of the land surface by running water, wind, ice or other geological agents.

Soil erosion is increased due to agricultural development, construction & strip - mining activities. Also it is greatly accelerated by overgrazing by livestock, burning of grass cover, and deforestation.

The loss of the topsoil makes soil less fertile and reduces its water holding capacity. The topsoil which is washed away, also contributes to water pollution by clogging lakes and increasing the turbidity of the water.

Agents of soil erosion: the way by which the soil lost during the erosion is classified as follows:

Water erosion:

Soil is removed by rainfall or by its surface flow action. Water erodes soil mainly by the sheet, rill, Gully, Rivarian erosion etc.

Wind erosion:

It occurs mainly in dry regions where the soil is mainly sandy and the vegetation is extremely poor.

Landslide or slip erosion:

In this water & gravity act together. Heavy rain creates hydraulic pressure that increases the weight of rocks.

Stream bank erosion:

The rivers during floods splash their water against the banks and thus cut through them.

Deforestation & overgrazing:

Increasing deforestation especially in the watershed areas has led to massive soil erosion.

Overgrazing is also a chronic hazard affecting forests, mountains & pastures.

Q.5 A. Noise: -

05

Noise is undesirable and unwanted sound. Not all sound is noise. What may considered as music to one person may be noise to another. It is not a substance that can accumulate in the environment like most other pollutants. Noise affects human body in a number of ways ranging from psychological to physiological effects.

Effect on human health:

Auditory effects: Noise level above 100 dB has adverse effect on hearing ability. Besides progressive hearing loss is usually caused by a very high intensity noise of about 150dB or more.

Speech interference: A person may face the problem of trying to understand another person talking to him in an environment with a high background noise level.

Sleep interference: The loss of sleep from noise affects personal well being & job performance.

General annoyance: It felt at about 75 to 85 dB. Blood vessels get constricted, breathing rate is affected, and muscle tension changes.

Task interference(working efficiency): Many people complain that noise makes them mentally ill & reduces their working efficiency.

Behavioral effects: Noise pollution lowers down the hearing capabilities of an individual, which in turn results in poor attention & concentration.

Emotional and person logical effects: These are chronic effects of noise pollution. People suffering from hypertension, isomania, blood pressure & deafness.

Acoustical privacy: Noise pollution leads to lack of acoustical privacy.

Pathological effects: These effects are produced by particular noise frequencies causing vibration or resonance in human bodies.

Disaster 05

management:

Natural disasters are always severe & sudden. Some disasters are geological in nature like the earthquakes, landslides, volcanic eruptions etc.

Floods

Earthquake

Cyclones

Landslide ,etc are normal earth processes.

Earthquakes are produced by the passage of vibratory waves through the rocks of the earth. A cyclone is an area of low pressure in the centre and high pressure outside. It is a powerful swirling storm that measures from 300 to 500 km in diameter. The wind in the centre of a cyclone

blows at a speed of 120 km in diameter. Flood is a situation when the river overflows its banks & the water spreads in the surrounding areas submerging them. Floods usually occur in the rainy season with the situation of high water table causes water to overflow. Landslide refers to rapid downslope movement of soil or rock. Human activities such as road construction, forest clearing, agricultural cultivation & building houses on steep and unstable slope increase both the frequency & the damage done by landslides.

Disaster management:

It is nothing but the effective organization, direction & utilization of available counter disaster resources. It is extremely important that disaster managers understand their role & responsibilities.

The role of a disaster manager:

Managing operations: It involves decision- making, problem solving

Managing people: It includes leadership, personnel evaluation

Managing organizations: It refers to planning, control & direction, resource management, communications & evaluation

Q 6 A) Effects of deforestation:

05

Deforestation: “ It is defined as the reckless felling of trees by human beings for their ulterior ends. Forests are burned or cut down for various reasons, like clearing of land for agriculture, harvesting of timber, expansion of cities & many more.

Effects of deforestation:

Soil erosion: In the absence of trees especially on the slopes the soil gets washed away with rain water.

Expansion of deserts: This effect is more pronounced in rain scarced areas.

Decrease in rainfall: Forests bring rains due to high rate of transpiration & precipitation. In the absence of forests, rainfall declines considerably.

Loss of fertile land: Less rainfall results into the loss of fertile land owing to less natural vegetational growth.

Effect on climate: Deforestation causes decrease in rainfall which in turn increases the climatic temperature.

Lowering of water of table

Economic losses: Deforestation will cause loss of industrial timber & non timber products & loss of long term productivity on the site.

Loss of flora and fauna

Loss of biodiversity: Loss of flora and fauna has resulted into loss of biodiversity, leading to disturbances in ecological balance.

Loss of medicinal plants

Environmental changes: Deforestation will lead to increase in carbon dioxide & other air pollutants concentration.

**Q.6
05**

B.

Grassland

ecosystem:

This is a type of terrestrial ecosystem. Temperate grasslands occur in regions too dry for forest moist for deserts. The annual rainfall ranges between 25 to 75 cm & is usually seasonal, while temperatures are moderate. The dominant animal species

include wild horses, asses & antelope of Eurasia. Other animal species include larks, owl, jackrabbit etc.

Structure:

The different components of a grassland ecosystem are:

1. Abiotic component: Are the nutrients present in the soil & the aerial environment.

2. Biotic component: It has three functional group:
 - i) Producer: Mainly grasses.
 - ii) Consumers: Primary, secondary & tertiary.
Primary consumers are cows, sheep, goat, deer, rabbits etc.
Secondary consumers are snakes, lizards, birds, foxes etc.
Tertiary consumers include hawks, which feed on secondary consumers.
 - iii) Decomposers: Micro-organisms like fungi, bacteria consume the dead bodies of higher life forms & then bring about their nutrients(minerals) back to the soil.

Types of grassland in India:

Himalayan postures

Terai

Semi arid plains of western India, central India& Deccan

Shola grasslands

Forest ecosystem:

Forest ecosystems provide numerous environmental services such as cycling nutrients, producing oxygen, maintaining biological diversity, providing wildlife habitat, affecting regional rainfall patterns, storing water, reducing flooding and many more. Some values are traditional,(e.g. wood, fruits, nuts, herbs, gums etc.)

Types & characteristic features:

1. Taiga or boreal forests:

These forests are of cold climates. The rainfall ranges from 10 to 35 cm, and the average temperatures are variable. Taiga ecosystems are characterized by dense strands of relatively small trees, typ. Under 30m. They are dominated by pines, firs, cedars, larches etc..

The dominant animals are deer, wolves, pumas & bears)

2. Temperate forests:

Are found in climates slightly warmer than those of the taiga forest. The annual precipitation ranges between 75 and 150cm.. The dominant vegetation includes tall trees such as maples, oaks, elms, beeches and chestnuts.

3. Tropical; rain forest:

These are located in the equatorial region The annual rainfall exceeds 140cm.

The dominant animals include monkeys, tropical birds, bats etc.

4. Temperate shrub forest:

These forests occur under drier climates with low winter rainfall.

Reptiles & small mammals are its characteristics.

5. Tropical savannah:

Tropical savanaah or seasonal forests occur where rainfall is high (100 to 150 cm). They are warm climate characterized by coarse grass & scattered trees.

Kangaroos are found only in the savannahs of Australia.

Types of forest in India

Coniferous forest

Evergreen forest

Deciduous forest

Thorn forest

Mangroves forest

Q.7 A) Fifteen principle of environment education: -

05

Need for information

Need to change the way in which we view our own environment

Need to create concern for our environment

For sustainable development

For proper utilization of resources

For avoid degradation of resources

Aware our next generation

Increase different values of nature

Justice to every living thing

Recovery of problematic issues

Finding new sustainable resources

Finding new sustainable technology

Take action as environment friendly

Give help to NGO or any person who doing environmental friendly work

Economically , environmentally stability

05 B) Benefits of biological diversity:

Timber:

It is one of the most important commodities in national & international trade.

Fishery:

Fish & other fishery products make up another class of commodities of great economic importance in international trade that are harvested mainly from wild sources. Though there are over 22000 species of fish , but just ten individual marine fish species make up one third of marine capture landings.

Food:

Presently around 200 species have been domesticated as food plants and of these about 15 to 20 are crops of major international economic importance.

Medicinal value:

Living organisms provide many useful drugs & medicines.

Genetic value:

Biological diversity is a valuable genetic resource.

Tourism:

Tourism industry is mainly based on observation of wildlife within protected areas and is a major source of income for many developing countries.

Poor indigenous people:

Are dependent on diversity in forest & wildlife for food, shelter, tools, fuel & materials for clothing & medicines.

Pollution control:

Plants & certain micro-organisms in particular can remove toxic substances from the air, water & soil. e.g. Toxins like carbon dioxide and sulphur dioxide are removed by vegetation, carbon monoxide is controlled by soil fungi & bacteria.