

**Ability Enhancement Compulsory Course-2
(AECC-2)
in
Environmental Studies
Semester-2**

Total Marks - 100 (Credit -2)

(50 Theory-MCQ type + 30 Project + 10 Internal Assessment + 10 Attendance)

Unit 6: Environmental Policies & Practices

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- **Climate Change:** We know that the *Climate* is average of weather over time across large regions. On the other hand the *Weather* is what is happening in one small region at one time. The global climate always changes, and there are many reasons for that, such as the interactions between components in the climate system like oceans, atmosphere, etc. The cyclone *Aila* was actually a climatic phenomenon, where the change in surface temperature over the Indian ocean formed the tropical cyclone *Aila* over the Bay of Bengal on May 23, 2009, causing extensive damage in India and Bangladesh. The climate change occurs because when the amount of energy in the entire climate system is changed it affects each and every component in the system.

We the humans are also responsible for the climate change. Human activities like the burning of fossil fuel increases the amount of carbon dioxide (CO₂) and other greenhouse gases in the atmosphere, enhancing the natural greenhouse effect. Increasing CO₂ causes the planet to heat up. The concentration of atmospheric CO₂ has increased by at least 40% in the last 200 years. The last time CO₂ increased this much was over a period of 6000 years, when the earth came out of an ice age, and the average surface temperature rose by 5°C. Burning fossil fuels, changes in land use (such as deforestation), small particles like smoke and dust in the atmosphere (aerosols) have altered the amount of sunlight that can be reflected back into space. The impact of this on the climate requires extensive investigations.

We all know that the earth will get warmer, but the exact climatic effects of the recent dramatic increase in CO₂ are not certain. The average temperature in many regions has been increasing in recent decades. So far we have seen an increase of 0.8°C in the average surface temperature of the earth since 1900, with melting in the polar regions and more frequent extreme weather. Few complex models predict that if we double the CO₂ emission there could be an average warming of about 2.0°C to 4.5°C. Once the climate starts to change, the effects of that can lead to further changes. This makes exact effects hard to predict. So if we double CO₂, we cannot exactly know what the average increase in temperature will be.

Small changes in average temperature can cause big changes across the earth, leading to more extreme weather, rising of sea levels and so some areas will become harder to live in. The Plants, animals, humans and societies have developed in a climate that has varied very little over very long timescales. We are not adapted to cope with rapid climate change.

According to two independent studies one by the NASA and other by the National Oceanic and Atmospheric Administration (NOAA), 2019 was the second warmest year on record. 2016 is the warmest year in NOAA's 140-year climate record and actually 2010-2019 is the hottest decade ever recorded.

As a consequence of the climate change in recent years many countries, particularly those situated in the mid to high latitudes, have experienced increased rainfall activity. In parts of Asia and Africa, the intensity and frequency of droughts have also increased in recent decades. All these are signs that the earth's climate is changing, making it more difficult for us to survive. Projections of future climate change are made by computer simulations with models that is based on the future population growth and uses of energy. The results of several different studies have shown that in the near future, the global mean surface temperature may rise by 2.0°C to 4.5°C. This projected rate of warming is more than what has occurred in the last 10000 years. This is likely to increase the floods and drought. By the year 2100, the global mean sea level is likely to increase at a higher rate leading to a rise in sea level of about 10 cm to 90 cm in different regions. More than half of the world's population are likely to be seriously impacted by this, since they live within 60 km of the sea. Some of the most vulnerable regions in Asia are the Ganges-Brahmaputra delta in Bangladesh, and many small islands including Maldives.

To a large extent, the public health depends on sufficient food, safe drinking water, and secure shelter. All these are going to be seriously affected by the climate change. The supply of fresh water may be affected, reducing availability of clean drinking water during drought and floods. The risk of spread of infectious disease such as diarrheal disease will increase. Food production will be seriously reduced and it would lead to starvation and malnutrition, especially for children. Climate change could lead to displacement of a large number of people, creating refugees and lead to further health issues. A Task Group set up by WHO has warned that climate change may have serious impacts on

human health and this will increase various current health problems, and may also bring new and unexpected ones.

- **Global Warming:** Global Warming refers to the increase in earth's average surface temperature, caused by the presence of greenhouse gases in the atmosphere.

Causes of Global Warming - The average surface temperature of the earth is maintained by a balance of various forms of solar and terrestrial radiations. The energy of the total incoming solar radiation at the top of earth's atmosphere is roughly about 1400 watt/metre² annually. About 70 percent of the incoming solar radiation is absorbed by the clouds, atmosphere and the earth's surface; rest of it is reflected back to space by clouds, atmosphere or reflective regions of earth's surface. Only a small fraction of the total solar radiation entering the atmosphere is absorbed by the earth's surface. Some of the heat radiating back to the atmosphere from the earth's surface gets trapped by the greenhouse gases, like carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) etc. The greenhouse gases emit the same amount of radiation they absorb and this radiation is emitted equally in all directions. The net effect of absorption by greenhouse gases is to increase the total amount of radiation emitted downward toward earth's surface, ultimately increasing the surface temperature. This mechanism is not quite the same as that which controls a true greenhouse, but the end effect is similar. The presence of greenhouse gases in the atmosphere leads to a warming of the earth's surface and lower part of the atmosphere compared to what would be expected in absence of greenhouse gases.

It is essential to distinguish the "natural greenhouse effect" from the "enhanced greenhouse effect" associated with human activity. The natural greenhouse effect occurs due to the surface warming properties of natural constituents of earth's atmosphere, like water vapor, carbon dioxide, methane, etc. The enhanced greenhouse effect is associated with the increased concentrations of greenhouse gases caused by human activities. The burning of fossil fuel raises the concentration of the greenhouse gases in the atmosphere, which have the potential to increase the atmospheric temperature by several degrees.

The average surface temperature is about 15°C. Surprisingly this is about 33°C higher than what it would be in absence of the greenhouse effect. In absence of the greenhouse gases most of the earth's surface would be frozen with a mean air temperature of -18°C. Carbon dioxide in the atmosphere has increased by about 31% since pre-industrial times, causing more heat to be trapped in the lower atmosphere.

Human activity has largely influenced the global warming. The most profound and well-known influence is the increase of concentration of greenhouse gases. Humans also have influenced it by changing the concentrations of aerosols and ozone, and by modifying the land cover of earth's surface. In contrast to the effects of greenhouse gases, the impact of aerosols is confined primarily to the northern hemisphere, where most of the world's industrial activity occurs. There are a number of ways in which changes in land use can influence climate. The deforestation contributes to global warming, as fewer plants are available to take up carbon dioxide from the atmosphere.

There are also number of natural factors that influence global warming. These include external influences such as volcanic eruptions, natural variations in the output of the sun, and slow changes in the configuration of earth's orbit relative to the sun.

Impacts of Global Warming -

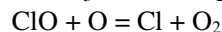
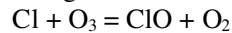
- (i) The major effect of global warming is the rising of sea level. As a result of which there will be flooding of fresh water marshlands, flooding of low-lying cities and islands with marine water.
- (ii) The changes in rainfall patterns is also a major problem. As a result in some areas, droughts and wildfires happen, whereas in other areas, flooding takes place.
- (iii) There is a significant increase in melting of old glaciers.
- (iv) Thinning of coral reefs due to warming seas, as well as acidification because of carbonic acid formation. Almost one third of the coral reefs are presently damaged by the warming seas.
- (v) There is also loss of plankton due to the warming of sea water. The ecosystems in many regions consisting of whales, sea lions, and other aquatic animals, has now reduced due to loss of plankton.

(vi) The Global Warming have serious impacts on human health too, as this increases various current health problems, and may also bring new and unexpected ones.

- **Ozone Layer Depletion:** The ozone layer is a layer in earth's atmosphere which contains relatively high concentrations of ozone gas (O₃). Ozone is a highly poisonous gas with a distinctive smell. It has three oxygen atoms in each molecule. Most ozone particles are scattered between 19 to 30 km up in the earth's atmosphere, in a region known as stratosphere. The ozone layer absorbs most of the sun's ultraviolet radiation, which is potentially damaging to life on earth. French physicists Charles Fabry and Henri Buisson discovered the ozone layer in 1913. Its properties were explored in detail by G.M.B. Dobson, who established a worldwide network of ozone monitoring stations which continues to operate today.

Without the ozone layer, ultraviolet radiation from the sun would not be stopped reaching the earth's surface, causing untold damage to most of the living species.

The ozone layer depletion occurs when the natural balance between the production and destruction of stratospheric ozone is disturbed. Although some natural phenomena can cause a temporary ozone depletion; chlorine and bromine released from man made compounds such as chlorofluorocarbons (CFCs) are the main cause of ozone depletion. There are many situations where human activities have significant effects on the environment. The damage of ozone layer is one of them. The chlorofluorocarbons can remain in the atmosphere up to 120 years or more. The CFCs are eventually broken down by the ultraviolet radiation in the stratosphere, releasing free chlorine. This chlorine then becomes actively involved in the destruction of ozone. Two molecules of ozone are replaced by three molecules of oxygen, leaving the chlorine free to repeat the reaction:



One chlorine atom can repeat this process up to 100000 times, resulting in a decrease of ozone. The CFCs are responsible for about 80% of total ozone depletion. The naturally occurring chlorines have the same effect on the ozone layer, but they have a shorter life span in the atmosphere. Although CFC emissions around the world have largely reduced due to international control agreements, due to their high life span the damage to the stratospheric ozone layer will continue well into the 21st century.

It is also well known that the chemicals released in the atmosphere during rocket launches also contribute to the depletion of ozone layer. In future ozone losses due to the rocket launches will eventually exceed ozone losses due to CFCs. As the space industry grows and other ozone depleting chemicals decline in the earth's stratosphere, the issue of ozone depletion from rocket launches is expected to move to the forefront. In order to prevent the damage to ozone layer the global market for rocket launches will require more stringent regulations.

The Montreal Protocol in 1987, a treaty for the protection of ozone layer, banned the use of CFCs completely by the year 2000. After 2000, the ozone layer is expected to recover slowly over a period of about 50 years.

Effects on Human & Animal Health -

Increased penetration of solar ultraviolet radiation have profound impact on human health with risks of eye diseases, skin cancer and infectious diseases. UV radiation could damage the cornea and lens of the eye. Chronic exposure to ultraviolet radiation leads to cataract of the cortical and posterior sub-capsular forms. Ultraviolet radiation can affect the immune system causing a number of infectious diseases. It is also likely to develop nonmelanoma skin cancer.

It is also a known fact that the physiological and developmental processes of plants are affected by over exposure of ultraviolet radiation. In forests and grass lands increased ultraviolet radiation results in changes in mutation, thus altering the bio-diversity in different ecosystems.

We know that about 30 percent of the animal protein for the human consumption comes from the sea alone. The increased levels of ultraviolet radiation exposure can have adverse impacts on the productivity of aquatic systems. It can also damage to early development stages of fish, shrimp, crab, amphibians and other animals.

Other effects of ultraviolet radiation include changes in the production and decomposition of plant matter, reduction of bacterioplankton growth in the ocean, increased degradation of aquatic dissolved organic matter etc.

- **Acid Rain:** Acid rain is a broad term that includes any form of precipitation with acidic components that fall to the ground from the atmosphere. This can include rain, snow, fog, hail and even dust that is acidic. When we burn fossil fuels such as oil, coal, and natural gas, chemicals like nitrogen dioxide and sulfur oxides are produced. They react with water and other chemicals in air forming sulfuric acid, nitric acid, along with other sulfates and nitrates pollutants. These pollutants spread upwards, and are carried by air to finally return to the ground in the form of acid rain, fog or snow. The corrosive nature of acid rain usually causes many forms of environmental damage. Acid pollutants may also occur as dry particles and gases, which when washed from the ground by rain, forms a more corrosive acidic solution. This is known as acid deposition. Damage from acid rain is widespread all over the world. The acids in acid rain react with any object they come in contact with.

Impacts of Acid Rain - Acid rain causes a widespread environmental damage.

1. Acid along with other chemicals in the air produces urban smog, which causes respiratory problems.
2. Acid rain flows to reach lakes, rivers and wetlands, causing the water to become acidic, which affects plant and animal life in aquatic ecosystems.
3. The acid rain washes away nutrients in the soil which are needed by the plants. It also dissolves naturally occurring toxic substances like mercury and aluminium to water, which is harmful for the plants.
4. It also indirectly affects the plants by creating holes in the waxy coating of leaves, creating brown dead spots which affect the photosynthesis. These trees are more vulnerable to insect infestations.
5. The acid corrodes the materials causing extensive damage. It damages buildings and other structures made of stone or metal. For instance the Taj Mahal is affected by the acid rain.
6. It has a far reaching effect on wildlife. When the acid rain affects one species, the entire food chain may be disrupted, ultimately endangering the whole ecosystem. For instance some insects have a high mortality in acidic water, and with the decline in supply of insects, frog populations may also decline.
7. The toxic substances leached from the soil can pollute water supply. Fish in these waters may be harmful for human consumption.

Environment Laws:

Wildlife Protection Act - Wildlife is a part of the environment which constitutes the wealth of a nation. The humans in the process of progress and development are causing endless damage to the wildlife. The Wildlife Protection Act provides protection to the listed species and establishes a network of protected areas. The *Wildlife Protection Act* in India was passed in 1972 for the protection of wild animals, birds and plants. It established the structure of the state's wildlife management. The act has sixty sections and six schedules which give varying degrees of protection and it extends to the whole of India. It prohibits the hunting of all animals specified in Schedules I to IV of the Act. In schedule VI protected plants are included. The Amendment to act in 2002 also prevents the commercial use of resources by the local people. It has also included fish in animals for the protection. This Act empowers the centre and state governments to declare any area as wildlife sanctuary and national park.

The Wildlife Protection Act is expected to stop people from breaking the law. However, there are some problem due to poaching of the endangered animals. To reduce this, number of forest staffs need to be increased, providing jeeps, weapons, radio equipments for establishing a strong deterrent force.

A person who breaks this Act shall be guilty of an offence against this Act. An offence committed in relation to any protected animal shall be punishable with imprisonment of one to six years and a fine of Rs 25000.

Forest Conservation Act - After independence the forest lands were destroyed indiscriminately, and approximately 4.3 million hectares of forest land was diverted during 1950 to 1980 for non-forestry purposes. In 1980, the *Forest Conservation Act* was enacted for providing a protection to the forests and to regulate the diversion of forest lands. The Act is an interface between the conservation of forest land and development. It permits the judicious and regulated use of forest land for non-forestry purposes.

The earlier forest policies were focused on revenue generation only. In the 1980s it became clear that the forests must be protected for their other functions. The new policy made conversion of forests into other uses much less possible. It gives priority to maintain the environmental stability and ecological balance. The Forest Conservation Act of 1980 was enacted to control the deforestation, thus it indirectly maintains the ecosystem and biological diversity. This act comprises of five sections. It ensured that the protected forest lands could not be dereserved without approval of the Central Government. This was created as States had begun to dereserve the reserved forests for non-forest use.

The Forest Conservation Act made it possible to maintain a greater control over the deforestation and specified penalties for the offenders.

Water (Prevention & Control of Pollution) Act - The *Water (Prevention & Control of Pollution) Act* was passed for the prevention and control of water pollution and for maintaining or restoring the water quality. The Act was formulated in 1974 to prevent the water pollution by agricultural, industrial and household waste-water that contaminate water sources. Water with high levels of pollutants that enter wells, lakes, wetlands, rivers and sea are serious health hazards. Controlling the small sources of different pollutants is one way to prevent pollution by giving punishment to a polluter. However preventing pollution is better than trying to punish the offenders.

As previously mentioned, the main objectives of this Act are to provide for prevention, control and abatement of water pollution and the maintenance or restoration of the wholesomeness of water. It is designed to estimate the pollution levels and punish polluters. The Central and State Governments have set up *Pollution Control Boards* that monitor the water pollution.

Pollution Control Boards: To control the problem of water pollution in the country the Government has given necessary powers to the Pollution Control Boards (PCBs). The Central and State water testing laboratories are set up to enable the PCBs to assess the extent of water pollution. Government also suggested penalties for violation of the Act.

The Central and State Boards are entitled to certain powers.

Central Board: The main function of the *Central Board* is to promote the cleanliness of rivers and lakes. It advises the Central Government on any matters concerning the prevention and control of the water pollution. The Board coordinates the activities of the State Boards and also resolves disputes. The Central Board provides technical assistance and guidelines to State Boards to carry out investigations and research relating to water pollution. The Board organizes awareness programs through mass media and also publishes water pollution data.

State Boards: The State Boards have the power to advise the State Government on water pollution. The Board advises State Governments with respect to location of industries. They inspect sewages, treatment plants, purification plants and the systems of disposal. It plans the utilization of sewage water for agriculture.

Penalties are charged under this Act for failing to furnish information required by the Board, or failing to inform the occurrence of any accident. An individual or organization that fails to comply with the law can be punished with imprisonment or with a fine of Rs 10000 or both.

Air (Prevention & Control of Pollution) Act - The *Air (Prevention & Control of Pollution) Act* was enacted by the Central Government to address the national environmental problem of air pollution. In 1981 the Central Government passed this Act to clean up air by controlling the pollution. The different sources of air pollution, such as power plants, industries, vehicles, etc. are no longer permitted to release some harmful chemicals beyond a prescribed level. The sources of air pollution are carbon monoxide, nitrogen oxide, lead, sulfur dioxide, and several other toxic substances. To ensure this, *Pollution Control Boards* (PCBs) were established by the Government to measure pollution levels at certain sources by testing the air. This is measured in parts per million or

micrograms per cubic meter. This Act was enacted to take proper action for controlling the level of air pollution, and thus preserving the high quality air. The air pollution is more acute in heavily industrialized and densely populated urbanized areas. The level of pollution due to various pollutants released through industrial emission are monitored by the PCBs set up in every State.

Main objectives of the Air (Prevention & Control of Pollution) Act - To provide for the prevention, control and abatement of air pollution. To provide for the establishment of Central and State Boards with a view to implement the Act. To confer on the Boards the powers to implement the provisions of the Act and assign to the Boards functions relating to pollution.

Powers and Functions of the Boards -

Central Board: The main function of the Central Board is to implement laws created to improve the air quality and to control air pollution in the country. The Central Board advises the Central Government on matters concerning the improvement of air quality. It coordinates with the State Boards and provides technical assistance and guidance to them. It collects information on the matters relating to air pollution.

State Pollution Control Boards: The main function of the State Pollution Control Boards is to advise the State Government on matters concerning the prevention and control of air pollution. The Board have the right to inspect all control equipments, industrial plants, and manufacturing process. The Board can also give orders to control pollution. They are empowered to inspect air pollution control areas whenever necessary. They are expected to provide standards with regard to the quantity and composition of emission of air pollutants into the atmosphere by different industrial plants. The State Board can also recognize or establish a laboratory to perform this work. The Board can penalized persons if they produce emissions of air pollutants in excess of the prescribed levels defined by the State Board.

Environment Protection Act - The protection and preservation of the environment is a major focus of all the governments around the world. Some of the major environmental problems faced by India relate to the preservation of wetlands, grass-lands, mangroves; conservation of forest and use of natural resources, which includes regulation of industry, agriculture, marine resources and movement of hazardous wastes. The Environment Protection Act of 1986 empowers the Central Government to protect and improve the environment, control and reduce pollution, and prohibit or restrict the operation of any industrial facility on environmental grounds.

The presence of high concentrations of harmful chemicals in the atmosphere and aquatic ecosystems leads to the disruption of food chains and loss of species. These are symptoms of a rapidly deteriorating environment. As the impacts grew over time the environmental protection became a national priority in 1970s. This Act was thus passed to protect the environment, as there was a growing concern over the deteriorating state of the environment.

Although there were several existing laws that directly or indirectly dealt with environmental issues it was necessary to have a general law for environmental protection. Before this Act the existing laws focused on very specific types of pollution, or were indirectly related to the environment through laws that control land use, protect national parks and wildlife. Thus there was a need for an authority which could take the lead role for studying, planning and implementing long term requirements of environmental safety.

Biodiversity Act - The Biodiversity Act (*Biological Diversity Act*) of 2002 is an Act of the Central Government for the preservation of biological diversity in India. The Act provides a mechanism for equitable sharing of traditional biological resources and knowledge. The Act is meant to achieve three main objectives. (i) conservation of the biodiversity, (ii) a sustainable use of the biological resources and (iii) equity in sharing benefits from such use of biological resources.

Under Section 2(b) of the Act, the term biodiversity has been defined as *the variability among living organisms from all sources and the ecological complexes of which they are part, and includes diversity within species or between species and of eco-systems*. It also defines the biological resources as *plants, animals and micro-organisms or parts thereof, their genetic material and by-products (excluding value added products) with actual or potential use or value, but does not include human genetic material*.

The key provisions of the Biodiversity Act are:

- (i) Prohibition on transfer of Indian genetic material outside the country without proper approval of the government.
- (ii) Prohibition on anyone claiming an intellectual property right over biodiversity or related knowledge, without permission of the government.
- (iii) Rules for sharing the benefits from the use of biodiversity, including transfer of technology, joint intellectual property right ownership, joint research and development etc.
- (iv) Protection of the traditional knowledge through appropriate laws.
- (v) Restriction on use of the genetically modified organisms.
- (vi) Formation of National Biodiversity Authority (NBA), State Biodiversity Board (SBB) at state level, and Biodiversity Management Committees (BMC) at village level.
- (vii) Setting up of national, state, and local biodiversity funds.

National Biodiversity Authority - The National Biodiversity Authority (NBA) was established in 2003 to implement the Biodiversity Act. The NBA advises the central government on conservation of biodiversity and also on selection of biological heritage sites. The NBA takes appropriate measures to oppose any grant of intellectual property rights in foreign countries, arising from the use of biological resources.

The NBA prohibits the transfer of research outcome obtained using biological resources to non-citizens or foreign companies without its permission. Also, without the permission of NBA no person can apply for a patent based on the research arising out of the biological resources.

Any offence under this Act is non-bailable. If any person violates the regulatory provisions of this Act, he will be punishable with imprisonment for a maximum period of five years or with fine of up to Rs. 1000000 or with both.

International Agreements:

Montreal Protocol, Kyoto Protocol and Climate Negotiations -

Over the last forty years, climate change and depletion of ozone layer have been believed to be the our largest environmental problems. The two problems involve global risks created by diverse nations, and both seem to be best handled through international agreements. The Montreal Protocol is believed to be a very successful agreement, which is largely successful in eliminating the production and use of the ozone-depleting chemicals. The Kyoto Protocol on the other hand is only partially successful toward stabilizing the emission of greenhouse gases.

Montreal Protocol: The Montreal Protocol is an international treaty designed to protect the stratospheric ozone. It was originally signed in 1987 and substantially amended in 1990 and 1992. It is a landmark international agreement for the protection of the ozone layer by phasing out the production of substances that are responsible for the depletion of ozone layer. The treaty essentially requires that the countries must end the production of ozone depleting substances. The treaty is structured around several groups of halogenated hydrocarbons that plays a important role in depleting stratospheric ozone. All of the ozone depleting substances controlled by the treaty contain either chlorine or bromine. In order to assist in reaching its goal, several international organizations report on the science of ozone depletion, implement projects to help move away from ozone depleting substances and provide a forum for policy discussions.

The multilateral fund for the implementation of the Montreal Protocol was the first financial mechanism created under any international treaty. It was created to provide the financial assistance to the developing countries to assist them phase out the use of ozone depleting chemicals.

Since the Montreal Protocol came into effect in 1989, the atmospheric concentrations of the ozone depleting chemicals like chlorofluorocarbons (CFCs) and related chlorinated hydrocarbons have either leveled off or decreased. The statistical analysis from 2010 shows a clear positive outcome from the Montreal Protocol to the stratospheric ozone. In 2001 NASA reported that the thickness of the ozone layer over Antarctica remained the same for previous three years. The recent scientific evaluation of the effects of the Montreal Protocol states that, *The Montreal Protocol is working: There is clear evidence of a decrease in the atmospheric burden of ozone-depleting substances and some early signs of stratospheric ozone recovery.* The treaty is also have effects on human health. A report by the U.S. environmental protection agency in 2015 estimated that the protection of the ozone

layer under the Montreal Protocol will prevent over 280 million cases of skin cancer, 1.5 million skin cancer deaths and 45 million cataracts in the United States alone. The Montreal Protocol has been characterized by the former United Nations secretary general Kofi Annan as “*Perhaps the most successful international agreement to date.*”

Kyoto Protocol: The Kyoto Protocol is an international agreement designed for the reduction of greenhouse gas emissions to address the possible changes in the climate. The Kyoto Protocol was adopted in 1997 and it came into force in 2005. In effect, the Kyoto Protocol requires the developed countries to cut the emission of greenhouse gas by 5% from the year 1990 level by 2008-2010. The Kyoto Protocol applies to the following six gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

The Kyoto Protocol was designed to fight the global warming by reducing the greenhouse gas emissions. A total of 191 states have signed and ratified the Protocol as of 2011. In December 2011 Canada withdrew from the Protocol. Under this Protocol 37 countries committed to reduce the production of four greenhouse gases (carbon dioxide, methane, nitrous oxide and sulphur hexafluoride) and two groups of gases (hydrofluorocarbons and perfluorocarbons). Other commitments of this Protocol includes: (i) Development, application and distribution of climate friendly technologies. (ii) Education, training and public awareness of climate change. (iii) Minimizing impacts on developing countries by establishing an adaptation fund for climate change. (iv) Accounting, reporting and review in order to ensure the integrity of the Protocol.

Although the Kyoto Protocol represented a landmark diplomatic accomplishment, it was not very success in reaching its targets. The reports issued in the first two years after the treaty took effect in 2005 indicated that most participants failed to meet their emission targets. Even if the targets were met, the ultimate benefit to the environment would not be significant. This is due to the fact that, the China, the world’s leading emitter of greenhouse gases and the United States, the world’s second largest emitter of greenhouse gases, were not bound by the Kyoto Protocol. It was also claimed that, even with full U.S. participation, the emission reduction limits called for in the protocol were too modest to make a detectable difference in global temperatures in subsequent several decades.

After a series of conferences, the delegates at the 21st *Conference of the Parties*, in 2015, signed a nonbinding agreement to limit the increase of the global average temperature to no more than 2°C above the pre-industrial level. This effectively replaced the Kyoto Protocol. It also authorized a progress review in every five years and the development of a fund for helping the developing countries adopt non-greenhouse gas producing technologies.

Convention on Biological Diversity (CBD) - The Biological Diversity or the Biodiversity is the degree of variation in life forms that exists within a ecosystem. The biodiversity has become a high value global asset to present and future generations. So for the conservation of biodiversity and sustainable use of its components the biodiversity conventions need to be created.

The Convention on Biological Diversity (CBD) is a multilateral treaty, originally signed in 1992 at the Earth Summit in Rio de Janeiro and entered into force in 1993. It has two supplementary agreements - The Cartagena Protocol and The Nagoya Protocol. The Convention on Biological Diversity has three main goals: (i) conservation of biodiversity, (ii) sustainable use of its components and (iii) fair and equitable sharing of benefits arising from the genetic resources. In other words, the objective of CBD is to design national strategies for the conservation and sustainable use of biological diversity.

The CBD recognized, for the first time in international law, that the biodiversity is an integral part of development process, and thus the conservation of biodiversity is *a common concern of humankind*. This agreement covers all ecosystems, species, and genetic resources and it links the traditional conservation efforts to the sustainable use of biological resources. It also covers biotechnology through its Cartagena Protocol, addressing development and transfer of technology and bio-safety issues.

Importantly the countries that join the CBD are obliged to implement all its provisions. Some of the issues addressed under the convention are the following:

- (i) Measures the incentives for the conservation and sustainable use of biological diversity.

- (ii) Regulated the access to genetic resources and traditional knowledge.
- (iii) Access and transfer of required technologies to the governments or local communities that provided the traditional knowledge, biodiversity resources etc.
- (iv) Transparent technical and scientific cooperation.
- (v) National reporting on implementation of the commitments of the treaty.
- (vi) Sharing the results of research and development and benefits arising from the utilization of genetic resources with the contracting party providing such resources.

Protected Area Network - The conservation area or protected area is the region which receives protection because of its natural or ecological values. In general the protected areas are those in which human occupation, or the exploitation of resources is limited. India is home 7-8% of the world's recorded species, including about 91000 animal species and about 46000 plant species. The protection of wild flora and fauna has been an integral part of Indian history. India has a vast network of national parks and sanctuaries, which covers a large part of its geographical area.

The protected area network in India includes 103 national parks, 537 wildlife sanctuaries, 67 conservation reserves and 26 community reserves, giving a combined coverage of about 4.9% of India's geographical area in 2016. Madhya Pradesh and Andaman and Nicobar islands have the maximum number of national parks (9). The national parks and sanctuaries are protected by the forest departments under the provisions of the Indian Forest Act of 1927, Wildlife (Protection) Act of 1972 & its amendments, Forest (Protection) Act of 1980, Biological Diversity Act of 2002 and Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act of 2006. In protected areas hunting of wild animals, destruction of habitat, constructions and other such activities are prohibited.

A national park is a protected area for the conservation of animals only, where collection of timber or other minor forest products, and private ownership rights are not allowed. A wildlife sanctuary is a protected area for the conservation of only animals, and the human activities like collection of timber or other minor forest products, and private ownership rights are allowed as long as they do not interfere with the well-being of the animals. The protected area network plays a significant role in conservation of the ecological wealth.

To conserve the wildlife inside the protected areas the government need to provide the locals or tribes living there some alternate livelihood options so that their forest based dependence is reduced. The government also need to increase vigilance and patrolling in protected areas to counter the poaching of endangered species.

Tribal Populations and Rights - The tribals are the *guardians* of the forest and its resources. Without tribal society the environmental protection is incomplete. India has the second largest population of the tribals after African continent. The total schedule tribe population in India as per 2011 census is about 10.4 crores which constitutes about 8.6% of total population of the country. Madhya Pradesh has the highest concentration of Scheduled Tribe population.

The tribals are the people who live in forest, and it is the only source of energy to their survival. They consider the forest as one of the most important part of their life. They are backward in nature and lives on very basic things provided by the nature. For them every part of the environment, from trees to rivers, are important part of their life. They worship trees, rivers, sun, air and land and they have given the environment the status of *God*.

The Tribals and the Forest - There are some special provisions in the Indian Constitution to safeguard the social, economic, and educational interests of weaker sections of the community including tribals. After independence, the tribals started losing their own forests and hills especially after the Forest Conservation Act, of 1980. In this Act no right could be acquired in reserved forest except by succession, under a contract with government or by persons having pre-existing rights. The rights were though lost as soon as the draft notification was issued. Any person indulging in setting fire to the forests, hunting, trespassing, fishing and setting traps was liable to be prosecuted.

Any law relating to forest rights considering the tribals as foes of the forest habitat will only help mask the intruders. This fact was accepted by the National Tiger Conservation Authority and

they suggested that the tiger reserve states should recruit local tribals as the field staff. It is essential to make a distinction between those who are in the forests for survival and those who are there for making profit.

The tribals are now become intruders in many parts of their own land because of the forest laws which prevent them from earning the forest for the collection of forest products. In many parts of India the tribals who were once cultivators have now become agricultural labourer and many are living in deplorable economic conditions. Recognizing the tribals right and allow them to collect minor forest products and sell it, has tremendous potential of increasing the income of the tribals. It will help improving their standard of living. This also indirectly ensures that their dependence on forest would motivate them to protect it. The major problem faced by the tribals is the lack of knowledge of their own rights.

The Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; also called the *Forest Rights Act*, is a key piece of forest legislation passed in 2006. The law concerns the rights of forest dwelling tribals to land and other natural resources, denied to them as a result of the continuance of colonial forest laws in India.

The Rights Under the Act:

1. *Right to hold and live in the forest land under the individual or common occupation for habitation or for self-cultivation for livelihood by a member or members of a forest dwelling Scheduled Tribe or other traditional forest dwellers.*
2. *Community rights such as nistar, by whatever name called, including those used in erstwhile Princely states, Zamindari or such intermediary regimes.*
3. *Right of ownership, access to collect, use, and dispose of minor forest produce (includes all non-timber forest produce of plant origin) which has been traditionally collected within or outside village boundaries.*
4. *Other community rights of uses of entitlements such as fish and other products of water bodies, grazing (both settled or transhumant) and traditional seasonal resource access of nomadic or pastoralist communities.*
5. *Rights including community tenures of habitat and habitation for primitive tribal groups and pre-agriculture communities.*
6. *Rights in or over disputed lands under any nomenclature in any State where claims are disputed.*
7. *Rights for conversion of Pattas or leases or grants issued by any local council or any State Govt. on forest lands to titles.*
8. *Rights of settlement and conversion of all forest villages, old habitation, unsurveyed villages and other villages in forest, whether recorded, notified or not into revenue villages.*
9. *Right to protect, regenerate or conserve or manage any community forest resource which they have been traditionally protecting and conserving for sustainable use.*
10. *Rights which are recognised under any State law or laws of any Autonomous Dist. Council or Autonomous Regional Council or which are accepted as rights of tribals under any traditional or customary law of the concerned tribes of any State.*
11. *Right of access to biodiversity and community right to intellectual property and traditional knowledge related to biodiversity and cultural diversity.*
12. *Any other traditional right customarily enjoyed by the forest dwelling Scheduled Tribes or other traditional forest dwellers, as the case may be, which are not mentioned in clauses-1 to 11, but excluding the traditional right of hunting or trapping extracting a part of the body of any species of wild animal.*

Human Wildlife Conflicts in Indian Context -

One of the most serious threats to India's wildlife is the conflict between the humans and wildlife. Human wildlife conflict not only threatens the individual species and their habitats, but it also indirectly amplify other factors like illegal trade in wildlife.

Causes of Conflict - The main reason leading to the human wildlife conflict are:

- (i) The reduction of the area and quality of the available habitat due to deforestation, intrusion, denotification of protected areas, expansion of cultivation, etc.

- (ii) The high rates of human and wild animal population growth. This increases the number of encounters between humans and animals leading to a conflict
- (iii) The easier availability and abundance of food and other resources outside a protected area than inside it.
- (iv) Due to poverty and other constraints humans are forced to enter protected areas and to exploit natural resources, bringing them into a direct conflict with wild species.

In India hundreds of people and thousands of wild animals die every year due to human wildlife conflict. Most of these death is due to the conflict with elephants. In the years between 2015-2018, the human-elephant conflict resulted 1713 human and 373 elephant deaths. In 2018 alone 227 people were killed by wild elephants, with Assam reporting the highest number of 86 death.

It is now very essential to monitor and evaluate the human wildlife conflict in all its forms across India. A successful mitigation of human-wildlife conflict requires a combination of National and State level initiatives.

Multiple-Choice Questions (MCQ) and Answers

- 001. Global warming also refers to as**
(A) Climate change
(B) Ecological change
(C) Atmosphere change
(D) None of the above
- 002. Global warming is observed century-scale rise in the _____ of the Earth's climate system.**
(A) Maximum temperature
(B) Minimum temperature
(C) Average temperature
(D) Temperature
- 003. Which of the following is not a greenhouse gas?**
(A) Carbon di-oxide
(B) Methane
(C) Nitrous oxide
(D) Carbon monoxide
- 004. Which of the following is (are) the anticipated effect(s) of Global warming?**
(A) Rising sea levels
(B) Changing precipitation
(C) Expansion of deserts
(D) All of the above
- 005. UNFCCC stands for**
(A) United Nations Framework Convention on Climate Change
(B) United Nations Federation Convention on Climate Change
(C) United Nations Framework Council on Climate Change
(D) United Nations Federation Council on Climate Change
- 006. Economies of the following country(ies) is(are) responsible for greatest annual CO₂ emissions.**
(A) USA
(B) China
(C) Both (A) and (B)
(D) Brazil
- 007. Ocean temperatures increase more slowly than land temperatures because of the larger effective _____ of the oceans.**
(A) Heat capacity
(B) Heat balance
(C) Heat transfer
(D) Heat exchanger
- 008. Which of the following types of sources of energy do not produce carbon di-oxide?**
(A) Wind energy
(B) Geothermal energy
(C) Hydroelectric energy
(D) All of the above

- 009. Reducing the amount of future climate change is called**
(A) Mitigation
(B) Geo- engineering
(C) Adaptation
(D) None of these
- 010. Without the Earth's atmosphere, the Earth's average temperature would be well below the _____ temperature of water**
(A) Boiling
(B) Freezing
(C) Vaporization
(D) None of the above
- 011. The major gas responsible for greenhouse effect is**
(A) Water vapor
(B) Carbon dioxide
(C) Methane
(D) Ozone
- 012. Following is (are) the cause(s) for CO₂ emissions.**
(A) Fossil fuel burning
(B) Changes in land use
(C) Calcination of limestone for clinker production
(D) All of the above
- 013. The Ozone layer lies in**
(A) Troposphere
(B) Stratosphere
(C) Ionosphere
(D) Mesosphere
- 014. The most visually striking evidence of global warming is**
(A) The increased precipitation along the Gulf coast states
(B) Highly varying temperature fluctuations felt during the winter months
(C) Rapid melting of glacial ice on nearly every continent
(D) All of the above
- 015. Following is the main cause of Global dimming.**
(A) Aerosols
(B) Biomes
(C) Acid rain
(D) All of the above
- 016. Carbon dioxide contributes _____ percent to global warming.**
(A) 10 to 15%
(B) 20 to 25%
(C) 30 to 35%
(D) 40 to 45%
- 017. A climate model is a representation of the physical, chemical and _____ processes that affect the climate system.**
(A) Biochemical
(B) Biological
(C) Biotic
(D) None of the above

018. Climate model may be used to predict

- (A) Local air movement
- (B) Ocean temperature
- (C) Ice cover on land
- (D) All of the above

019. Climate represents _____

- (A) The long-term average weather and its statistical variation for a given region
- (B) Weather averaged over a year
- (C) It is a measure of variations in the amount of precipitation
- (D) None of the above

020. Greenhouse effect refers to

- (A) Ability of atmosphere to retain water vapor
- (B) Ability of certain atmospheric gases to trap heat and keep the planet relatively warm
- (C) Ability of cloud to scatter electromagnetic radiation
- (D) None of the above

021. Loss of sea ice by melting in the Arctic Ocean

- (A) Will result in sea-level rise
- (B) May result in positive feedback that amplifies global warming
- (C) Will result in cooler temperature in the Arctic
- (D) None of the above

022. Energy sources that do not increase carbon emissions include –

- (A) Solar cells
- (B) Wind mills
- (C) Nuclear power plants
- (D) All of the above

023. How does climate change (global warming) affect human health?

- (A) By increasing illnesses such as heat stress , cardiovascular disease and kidney disease
- (B) By increasing respiratory illnesses such as asthma and allergies
- (C) By increasing insect borne infections such as dengue fever
- (D) All of the above

024. Which of the following do you think has the least impact of climate change in forests?

- (A) Change in quality and quantity of wood supply
- (B) Loss of biodiversity
- (C) Loss of forest based employment
- (D) Altered forest productivity

025. Of the following, the most impactful action you can take to reduce your carbon footprint is:

- (A) Turn off your lights more often
- (B) Drive a hybrid car
- (C) Eat a plant-based diet
- (D) Hang your clothes to dry

026. The Ozone hole is a much larger springtime decrease in ____ ozone around Erath's polar regions.

- (A) exospheric
- (B) stratospheric
- (C) thermospheric
- (D) mesospheric

- 027. The main cause of ozone depletion and the ozone hole is**
(A) halocarbon refrigerants
(B) propellants
(C) foam-blowing agents
(D) all of the above
- 028. Following are referred to as ozone-depleting substances.**
(A) CFCs
(B) HCFCs
(C) halons
(D) all of the above
- 029. The ozone layer prevents ___ from passing through the Earth's atmosphere.**
(A) Ultraviolet rays
(B) Infrared rays
(C) x-rays
(D) all of the above
- 030. Ultraviolet rays cause**
(A) skin cancer
(B) sunburn
(C) cataracts
(D) all of the above
- 031. Following bans the production of ozone-depleting chemicals.**
(A) Montreal Protocol
(B) Kyoto Protocol
(C) Geneva Protocol
(D) None of the above
- 032. Ozone can be destroyed by the following free radical(s)**
(A) hydroxyl radicals (OH·)
(B) nitric oxide radical (NO·)
(C) chlorine radical (Cl·)
(D) all of the above
- 033. The total amount of ozone in the atmosphere above a point on the earth's surface is measured in**
(A) astronomical unit
(B) dobson unit
(C) angstrom unit
(D) none of the above
- 034. Following is (are) the greenhouse gas(es).**
(A) carbon dioxide
(B) chlorofluorocarbons
(C) both (A) and (B)
(D) none of the above
- 035. CFCs were used as**
(A) fuel in airplanes
(B) refrigerants in cooling units
(C) paint
(D) all of the above

036. The ozone hole occurs during the Antarctic

- (A) Summer
- (B) Autumn
- (C) Spring**
- (D) All of the above

037. Ozone depletion would magnify production of

- (A) Vitamin A
- (B) Vitamin B
- (C) Vitamin C
- (D) Vitamin D**

038. Montreal Protocol was signed in

- (A) 1986
- (B) 1987**
- (C) 1988
- (D) 1989

039. “International Day for the Preservation of the Ozone Layer” or “World Ozone Day” is celebrated on

- (A) September 16**
- (B) September 18
- (C) October 16
- (D) October 18

040. Which of the following is not the consequence of ozone layer depletion?

- (A) Increased ultraviolet rays
- (B) Malignant melanoma-Another form of skin cancer
- (C) Cyanobacteria are sensitive to UV radiation and would be affected by its increase.
- (D) Tides**

041. When was the first ozone hole discovered?

- (A) 1980s
- (B) 1950s
- (C) 1970s**
- (D) 1990s

042. The depletion in the Ozone layer is caused by

- (A) Carbon dioxide
- (B) Nitrous oxide
- (C) Methane
- (D) Chlorofluorocarbon**

043. Which of the following is a prime health risks associated with greater UV radiation through the atmosphere due to depletion of ozone layer?

- (A) Damage to digestive system
- (B) Increased liver cancer
- (C) Increased skin cancer**
- (D) Neurological disorder

- 044. Montreal protocol is related to the**
(A) Global warming
(B) Ozone layer depletion
(C) Sustainable development
(D) Food security
- 045. CFCs (chlorofluorocarbons) are greenhouse gases that have caused a rise of 3°C in the global temperatures in the past century. Name the CFC that is used in refrigerators.**
(A) Carbon dioxide
(B) Methane
(C) Ammonia
(D) Freon
- 046. Which one of the following cause acid rain?**
(A) Water pollution
(B) Soil pollution
(C) Air pollution
(D) Noise Pollution
- 047. What are two acids formed when gases react with the tiny droplets of water in clouds?**
(A) Sulphuric acids and nitric acid
(B) Hydrochloric acid and nitric acid
(C) Sulfurous acid and acetylsalicylic acid
(D) Sulphuric acid and hydrochloric acid
- 048. What is the nature of acid rain?**
(A) Withstanding
(B) Protecting
(C) Corrosive
(D) Balancing
- 049. Which of the following way acid rain affects the plants?**
(A) By nourishing the nutrients from the soil
(B) By increasing the nutrients from the soil
(C) By removing nutrients from the soil
(D) By balancing the nutrients in the soil
- 050. What is the result of acid rain when it falls into water bodies?**
(A) The water becomes acidic
(B) The water becomes pure
(C) The water increase its nutrients value
(D) The water increase its level
- 051. Which one of the way can prevent acid rain?**
(A) Increase the emission of sulfur dioxide and nitrogen oxides
(B) Decrease the emission of sulfur dioxide and nitrogen oxides
(C) Increase in the emission of hydrochloride and phosphate
(D) Decrease in the emission of hydrochloride and phosphate
- 052. The Taj Mahal in India is affected by _____**
(A) Fog
(B) Acid rain
(C) Water pollution
(D) Spoil Pollution

053. Sulphur dioxide is produced by

- (A) Lightning strikes
- (B) Volcanic eruptions**
- (C) Gasoline engine
- (D) All of the above

054. The adverse effect(s) of acid rain is(are)

- (A) Causing paint to peel
- (B) Corrosion of steel structures
- (C) Killing insects
- (D) All of the above**

055. Following is (are) the type(s) of acid deposition

- (A) Wet deposition
- (B) Dry deposition
- (C) Both (A) and (B)**
- (D) Solid deposition

056. The acid rain leach away

- (A) Calcium
- (B) Magnesium
- (C) Both (A) and (B)**
- (D) None of the elements

057. In cultivated, following may be added to increase the ability of the soil to keep the pH stable.

- (A) Iodine
- (B) Sodium
- (C) Limestone**
- (D) All of the above

058. Which of the following power station(s) produce sulphur dioxide

- (A) Coal firing power stations**
- (B) Hydroelectric power plants
- (C) Nuclear power plants
- (D) All of the above

059. Acid Rain is caused by emissions of

- (A) Sulphur dioxide
- (B) Nitrogen oxide
- (C) Both (A) and (B)**
- (D) Carbon dioxide

060. The world as World Environmental day is celebrated on

- (A) December 1
- (B) June 5**
- (C) November 14
- (D) August 15

061. The provisions for Environmental Protection in the constitution were made in

- (A) 1976**
- (B) 1950
- (C) 1982
- (D) 1960

062. The first of the major environmental protection act to be promulgated in India was:

- (A) Water Act
- (B) Air Act
- (C) Environmental Act
- (D) Noise Pollution Rule

063. The Forest (Conservation) Act was enacted in the year

- (A) 1986
- (B) 1974
- (C) 1980
- (D) 1972

064. Penalty for conservation of the provisions of the Forest Act is under

- (A) Section 3A
- (B) Section 4A
- (C) Section 12A
- (D) Section 8A

065. The Wildlife (Protection) Act contains:

- (A) 7 Chapters
- (B) 6 Chapters
- (C) 5 Chapters
- (D) 8 Chapters

066. The Wildlife (Protection) Act contains

- (A) 66 Sections
- (B) 6 Sections
- (C) 7 Sections
- (D) 46 Sections

067. The Water (Prevention and Control of Pollution) Act was enacted in the year

- (A) 1986
- (B) 1974
- (C) 1994
- (D) 1975

068. The Water Act contains

- (A) 4 Chapters
- (B) 5 Chapters
- (C) 7 Chapters
- (D) 8 Chapters

069. The Water Act have

- (A) 64 Sections
- (B) 68 Sections
- (C) 45 Sections
- (D) 62 Sections

070. The Air Act contains

- (A) 5 Chapters
- (B) 6 Chapters
- (C) 7 Chapters
- (D) 8 Chapters

071. The Air Act have

- (A) 56 Section
- (B) 54 Section
- (C) 58 Section
- (D) 62 Section

072. The Air (Prevention and Control of Pollution) Act was enacted in the year

- (A) 1981
- (B) 1996
- (C) 2000
- (D) 1974

073. The Environmental (Protection) Act was enacted in the year

- (A) 1986
- (B) 1992
- (C) 1984
- (D) 1974

074. The Environmental (Protection) Act consists

- (A) 2 Chapters
- (B) 4 Chapters
- (C) 8 Chapters
- (D) 7 Chapters

075. The Environmental (Protection) Act contains

- (A) 25 Sections
- (B) 12 Sections
- (C) 26 Sections
- (D) 14 Sections

076. The NGOs stands for

- (A) Non-Governmental Organization
- (B) Nine-Governmental Organization
- (C) Non-Gained Organizations
- (D) National-Grade Organization

077. The Biodiversity Act (Biological Diversity Act) was enacted in the year

- (A) 2002
- (B) 1992
- (C) 2012
- (D) 1998

078. The National Biodiversity Authority (NBA) was established in the year

- (A) 2001
- (B) 1999
- (C) 2003
- (D) 2005

079. The Kyoto Protocol is an international agreement designed for

- (A) the reduction of greenhouse gas
- (B) the protection of ozone layer
- (C) both (A) and (B)
- (D) none of above

- 080. The Kyoto Protocol was adopted in the year**
(A) 2002
(B) 1972
(C) 1997
(D) 2007
- 081. The Kyoto Protocol came into force in the year**
(A) 2001
(B) 1997
(C) 2005
(D) 2009
- 082. The Convention on Biological Diversity (CBD) was signed in the year**
(A) 2002
(B) 1992
(C) 1982
(D) 2012
- 083. The Convention on Biological Diversity (CBD) came into force in the year**
(A) 2001
(B) 1997
(C) 2009
(D) 1993
- 084. Which one of the following is not the outcome of human-wildlife conflict?**
(A) Damage to human property
(B) Increase in the forest area
(C) Injury and loss of life of humans and wildlife
(D) Destruction of habitat
- 085. Which one of the following is the cause for human-wildlife conflicts?**
(A) Reduction in the availability of natural food resources
(B) Increase in the forest area
(C) Adequate rainfall
(D) Curiosity of wildlife animals that leads for the invasion to outside the forest area
- 086. Which one of the following is a way to reduce human-wildlife conflict?**
(A) Killing all the wild animals
(B) Shifting all the wild animals from natural forests to zoo
(C) Use of strobe lights
(D) Kill the animals when they invade outside the forests
- 087. What is called for any interaction between humans and wildlife that result in negative impacts on cultural life or on the environment?**
(A) Human-wildlife interactions
(B) Human-wildlife services
(C) Human-wildlife adjustment
(D) Human-wildlife conflict
- 088. The Jim Corbett National Park is famous for notable man-eaters _____**
(A) Leopard
(B) Tiger
(C) Bear
(D) Lion

089. Which one of the following is the major threat for biodiversity?

- (A) Reduction in the cutting of trees
- (B) Increase in the number of trees
- (C) Climate change
- (D) Balance in the predator and prey in forests

090. In which year the Wildlife Protection Act was implemented in India?

- (A) 1952
- (B) 1962
- (C) 1972
- (D) 1982