ICSE Class 9 Revised Environmental Science Syllabus PDF 2020-21

ENVIRONMENTAL SCIENCE (82)

Candidates offering Environmental Applications (Group III) are not eligible to offer Environmental Science (Group II).

CLASS IX

There will be one paper of **two hours** duration carrying 80 marks and Internal Assessment of 20 marks.

The paper will have **two** Sections:

Section A (**Compulsory**) will contain short answer questions covering the entire syllabus.

Section B will contain **six** questions. Candidates will be required to answer any **four** questions from this section.

1. **Understanding our Environment**

   (a) What is Environmental Science?

   What do we understand by 'Environment'? What does the study of Environmental Science involve?

   (b) What are our main environmental problems?

   Environmental problems to be studied in terms of resource depletion, pollution and extinction of species.

   (c) A global perspective of environmental problems.

   To be studied with reference to the developed and developing countries.

   (d) The root of environmental problems.

   Population crisis and consumption crisis should be covered.

   (e) A sustainable world.

   Concept of sustainability to be explained; sustainable societies to be discussed.

2. **Living things in Ecosystems**

   (a) What is an ecosystem?

   Concept of ecosystems to be explained; biotic and abiotic structures, organisms and species; populations, communities.

   (b) Habitat and ecological niche.

   To be discussed in terms of address and function.

   (c) How species interact with each other.

   Interaction of species should be covered in terms of - predation, competition, parasitism, mutualism and commensalism. Law of Limiting Factors; synergisms.

   (d) Adapting to the environment.

   Evolution by natural selection; co-evolution, extinction.

3. **How Ecosystems work**

   Energy flow in ecosystems.

   An explanation of how life depends on the sun; who eats what; respiration: burning the fuel. Energy transfer: food chains, food webs and trophic levels.

4. **Kinds of Ecosystems**

   Forest, Grassland, Desert, Tundra, Freshwater Ecosystems and Marine Ecosystems

   Threats to the above ecosystems.

5. **Water**

   Freshwater pollution.

   Point pollution and non-point pollution; wastewater treatment plants, pathogens. The manner in which water pollution affects ecosystems; artificial eutrophication, thermal pollution. Cleaning up water pollution. The special problem of groundwater pollution; bottled water.

6. **Air**

(a) What causes air pollution?

Air pollution due to - natural disasters; domestic combustion; air pollution on wheels; industrial air pollution.

Major air pollutants - carbon monoxide, oxides of nitrogen, oxides of sulphur, ozone, lead, hydrocarbons, benzene and particulates -their sources, health effects and the environmental effects must be studied.

Classification of air pollutants based on composition - gaseous pollutants and particulate matter (grit, dust, smoke and lead oxide); broader classification - primary and secondary pollutants.

Aerosols (smog), sources – natural (continental, oceanic and anthropogenic); their effect on our lives.

Air pollution episode - the Bhopal gas tragedy.

(b) Thermal inversions, photochemical smog and acid precipitation.

Thermal inversions (Los Angeles), Photochemical Smog (Mexico City) and Acid Precipitation (Mumbai) - how acid precipitation affects ecosystems.

(c) Impact of air pollution.

Impact of air pollution should be covered in terms of economic losses, lowered agricultural productivity and health problems.

7. **Atmosphere and Climate**

(a) Greenhouse earth.

The Greenhouse Effect, rising carbon dioxide levels, GHGs and the earth's temperature (global warming); effect on weather, agriculture and sea-levels; slowing the temperature change.

(b) The Ozone layer.

Ozone in the troposphere, ozone in the stratosphere; detection of the damage to the ozone layer; causes and consequences of ozone thinning; alternatives to CFCs.

8. **Soil and Land**

(a) Deforestation.

Causes and consequences of rapid and progressive deforestation in the developing world - fuel crisis, competition for land, land exploited for cash and food crops, population pressures, increasing demand for timber to meet the needs of the developed world, grazing and its link with desertification.

Effects of deforestation on climate, atmosphere and soil process.

(b) Soil erosion and desertification.

Causes and consequences of soil erosion and desertification - removal of vegetation, overgrazing, overculture, clearance of slopes, drought, heavy rainfall, bad farming practices.

9. **People**

(a) World poverty and gap between developed and developing countries.

Dimensions of world poverty and gap between developed and developing countries using development indicators such as per-capita incomes, housing, levels of disease and nutrition.

(b) Poverty in developed countries, poverty in developing countries.

Rural poverty and urban poverty.

(c) The implications of poverty trap for the environment in developing countries.

Self-explanatory.

10. **Urbanisation**

(a) Causes of urbanisation.

The push-pull factors to be discussed.

(b) Manifestations of urbanisation.

Growth of slums, growth of informal sector, pressure on civic amenities; degradation of human resources; growing sense of despair.

11. **Agriculture**

(a) Unsustainable patterns of modern industrialised agriculture.

Monocultures, disappearance of traditional crop varieties, pollution risk due to use of pesticides and inorganic fertilizers; problems of irrigation – surface and ground water.

(b) The Green Revolution.

Discussion on whether Green Revolution is a success or a failure.

INTERNAL ASSESSMENT

Any **one** project/assignment from the prescribed syllabus.

Suggested Assignments

1. Make a survey of any one threat to the local environment with suggestions as to how the impact of the threat could be gradually reduced.

2. Make a functional model of an apparatus/equipment that could be used to alleviate the impact of any pollutant and, make a survey to study the effectiveness of this apparatus/equipment. (The report of the study is to form a part of the Project Work.)