

## ENVIRONMENTAL SCIENCE (82)

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

The subject deals with the interdependence of living things within their environment and provides an insight into the orderly interplay of factors influencing environmental change. The impact of human demands on renewable and non-renewable resources and the limited availability of these resources in nature, have been linked to correlate with patterns of human behaviour necessary to evolve a sustainable environmental paradigm.

### Aims:

1. To acquire knowledge of the origin and functioning of the natural system and its correlation with the living world.
2. To develop an understanding that human beings, plants and animals are part of a natural phenomenon and are interdependent.
3. To appreciate the influence of human activity on natural processes.
4. To develop an awareness of the need and responsibility to keep the natural system in a condition that it sustains life.
5. To develop sensitivity in personal attitudes to environmental issues.
6. To develop an understanding of how local environments contribute to the global environment.
7. To develop a sense of responsibility and concern for welfare of the environment and all life forms which share this planet.
8. To develop a keen civic sense.
9. To develop a sound basis for further study, personal development and participation in local and global environmental concerns.

## 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?
- (b) What are our main environmental problems?
- (c) A global perspective of environmental problems.
- (d) The root of environmental problems.
- (e) A sustainable world.

### 2. Living things in Ecosystems

- (a) What is an ecosystem?
- (b) Habitat and ecological niche.

- (c) How species interact with each other.
- (d) Adapting to the environment.

### 3. How Ecosystems work

- (a) Energy flow in ecosystems.
- (b) The cycling of materials.
- (c) How ecosystems change.

### 4. Kinds of Ecosystems

- (a) Forests.
- (b) Grasslands, Deserts and Tundra.
- (c) Freshwater ecosystems.
- (d) Marine ecosystems.
- (e) Bio-geographic zones of India.

### 5. Water

- (a) Our water resources.
- (b) Freshwater pollution.
- (c) Ocean pollution.

## 6. Air

- (a) What causes air pollution?
- (b) Thermal inversions, photochemical smog and acid precipitation.
- (c) Impact of air pollution.

## 7. Atmosphere and Climate

- (a) The atmosphere.
- (b) Climate.
- (c) Greenhouse earth.
- (d) The ozone layer.

## 8. Soil and Land

- (a) Deforestation.
- (b) Soil erosion and desertification.
- (c) Land pollution.

## 9. People

- (a) World poverty and gap between developed and developing countries.
- (b) Poverty in developed countries, poverty in developing countries.
- (c) The implications of poverty trap for the environment in developing countries.

## 10. Urbanisation

- (a) Causes of urbanisation.
- (b) Manifestations of urbanisation.

- (c) Social, economic and environmental problems.

## 11. Agriculture

- (a) Unsustainable patterns of modern industrialised agriculture.
- (b) Environmental damage due to large farm units.
- (c) Food mountains in developed countries.
- (d) The Green Revolution.

### 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.)

## CLASS X

*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. Controlling Air pollution

- (a) From domestic combustion.
- (b) From industries.
- (c) From vehicles.

### 2. Addressing Population

- (a) The link between growing population and environmental degradation.
- (b) The demographic transition.
- (c) Strategies for controlling growth of population.
- (d) Development framework for poverty alleviation.

### 3. Managing the Urban Environment

- (a) Urbanisation - A challenge to the future.
- (b) Planning environmental improvement.
- (c) Rural development to counter migration.

- (d) Development of secondary cities to counter migration.
- (e) Community participation and contribution of private enterprises.

#### 4. Managing Soil and Land

- (a) Conserving soil.
- (b) Land reforms.
- (c) Integrated rural development.
- (d) Role of women and community in conservation.
- (e) Combating deforestation.
- (f) Managing forest grazing.
- (g) Alternatives to timber.

#### 5. Food

- (a) Sustainable agriculture.
- (b) Problem of global food security, food aid.

#### 6. Biodiversity

- (a) Biodiversity at risk due to human actions.
- (b) Conserving our genetic resource: in-situ and ex-situ; harvesting wildlife.
- (c) Conservation strategies at national and international levels.

#### 7. Energy

- (a) Fossil Fuels used to produce electricity.
- (b) Nuclear energy.
- (c) A sustainable energy future.

#### 8. Waste

- (a) Solid waste: the throwaway society.
- (b) Solid waste: options for the future.

#### 9. Environment and Development

- (a) Global environmental pollution.
- (b) Economic development and environmental degradation.
- (c) International trade.
- (d) Role of multinational corporations.

#### 10. Toward a Sustainable Future

- (a) Global interdependence – economic and environmental.
- (b) International cooperation.
- (c) Sustainable development.
- (d) Role of non-governmental organisations.
- (e) Technology that sustains.

### INTERNAL ASSESSMENT

A minimum of three assignments as prescribed by the teacher, need to be completed.

#### Suggested Assignments

1. Make a field study of the effect of human interaction on the natural environment and write a project report (1500 words) on the likely impact of the interaction on the global environment.
2. Prepare an original study/essay (2000 words) on an area of the prescribed curriculum that is indicative of his/her appreciation/concern for environmental issues and make a functional model to support the above.

### EVALUATION

The assignments/project work are to be evaluated by the subject teacher and by an External Examiner. (The External Examiner may be a teacher nominated by the Principal, who could be from the faculty, **but not teaching the subject in the section/class**. For example, a teacher of EVS of Class VIII may be deputed to be an External Examiner for Class X, Environmental Science projects.)

The Internal Examiner and the External Examiner will assess the assignments independently.

#### Award of marks (20 Marks)

Subject Teacher (Internal Examiner)	10 marks
External Examiner	10 marks

The total marks obtained out of 20 are to be sent to the Council by the Principal of the school.

The Head of the school will be responsible for the entry of marks on the mark sheets provided by the Council.

**INTERNAL ASSESSMENT IN ENVIRONMENTAL SCIENCE - GUIDELINES FOR MARKING WITH GRADES**

<b>Criteria</b>	<b>Preparation</b>	<b>Investigation/ Gathering Data</b>	<b>Analysis/Inference</b>	<b>Solutions Alternatives/ Innovations</b>	<b>Presentation</b>	<b>Marks</b>
Grade I	Follows instructions with understanding, modifies if needed. Background information correct. Level of awareness high.	Is able to ask right questions. Knows whom to ask, when and how. Can deal with more than one variable.	Analyses systematically. Can see sequences or correlation. Can segregate fact from opinion.	Innovative ideas presented. Alternatives suggested.	Accurate. Feasible, neat, well labelled diagrams. Index and references given.	4 marks
Grade II	Follows instructions step-by-step. Awareness is good. Background information correct.	Is able to ask questions and identify whom to ask when and how. Can handle two variables only.	Makes observations correctly. Analysis fair.	Alternatives presented. Innovative but not practical.	Accurate. Neat, well labelled diagrams, index and references given.	3 marks
Grade III	Follows simple instructions only. Awareness basic. Background information sketchy.	Needs help with the investigations. Has suggestions but cannot decide.	Observation - help needed. Needs guidance to see correlations or sequence.	Obvious solutions presented. Not innovative.	A bit disorganised, but neat and accurate. Either index or references missing.	2 marks
Grade IV	Follows some instructions but confused. Has to be made aware. Background information incorrect in places.	Needs to be told what questions to be asked, whom to ask or where to gather the data from.	Detailed instructions required to draw inferences. Charts have to be made.	Thinks of solutions under guidance.	Poorly organised. Some things missing. Index and references missing.	1 mark
Grade V	Confused about instructions. Has to be made aware. Needs help with background information.	Gets stuck at every step. Questionnaire has to be formulated.	Even with help, analysis is not clear. Takes teacher's word for it.	Solutions not forthcoming.	Overall impression very poor. Not very accurate.	0 mark