

ENVIRONMENTAL SCIENCE

Maximum Marks: 70

Time Allotted: Three Hours

Reading Time: Additional Fifteen minutes

Instructions to Candidates

1. You are allowed an **additional fifteen minutes** for **only** reading the question paper.
2. You must **NOT** start writing during reading time.
3. This question paper has **7 printed pages** and **one blank page**.
4. There are **twelve** questions in the paper. All questions are compulsory.
5. This paper is divided into **three sections: A, B and C**.
6. **Section A** has **fourteen subparts** which are very short answer questions. Each question carries 1 mark.
7. While attempting **Multiple Choice Questions** in Section A, you are required to write **only ONE** option as the answer.
8. **Section B** has **seven questions** which are short answer questions. Each question carries 4 marks.
9. **Section C** has **four questions** which are long answer questions. Each question carries 7 marks.
10. **Internal choices** have been provided in **two questions in Section B** and in **one question in Section C**.
11. The intended marks for questions are given in brackets [].

Instruction to Supervising Examiner

1. Kindly read **aloud** the Instructions given above to all the candidates present in the examination hall.

SECTION A - 14 MARKS

Question 1

- (i) Secondary pollutants are those pollutants that are not emitted directly in the atmosphere but are formed by chemical reactions. [1]

Which one of the following areas is likely to have a high concentration of the secondary pollutants?

- (a) A remote village in Meghalaya
 - (b) Mangrove forests in Sunderbans
 - (c) A tribal area in Rann of Kutch
 - (d) Area around the coal mines in Jharkhand
- (ii) Given below are two statements marked, Assertion and Reason. Read the two statements carefully and choose the correct option. [1]

Assertion: The use of natural predators like frogs and snakes helps control the pest population in agriculture.

Reason: Chemical pesticides such as DDT can effectively control the pest population.

- (a) Both Assertion and Reason are true and Reason is the correct explanation for Assertion.
 - (b) Both Assertion and Reason are true but Reason is not the correct explanation for Assertion.
 - (c) Assertion is true and Reason is false.
 - (d) Both Assertion and Reason are false.
- (iii) A group of students conducted a test in their laboratory at school to assess the quality of water collected from a nearby pond. They found the level of nitrates to be very high. [1]

Hence, they concluded that it would lead to:

- (a) an increase in the algal bloom.
- (b) an increase in the oxygen level.
- (c) a decrease in turbidity of water.
- (d) a decrease in hardness of water.

- (iv) Which one of the following countries has tackled the issue of food insecurity by adopting a sustainable approach? [1]
- (a) USA, with its large scale commercial farming
 - (b) UAE, with its large scale import of wheat
 - (c) Cuba, with its consistent approach to organic farming
 - (d) Sudan, with its mechanised rain-fed farming
- (v) Study the relation between the first and the second words / terms given below and fill in the missing word / term on that basis. [2]
- (a) Biofertilizer: Azotobacter :: _____ : Neem
 - (b) Cuba: Organic farming :: Bogota : _____
- (vi) Name the non-governmental organisation founded by Bill Darnell and Dorothy Stowe in 1971 that uses non-violent, creative methods to highlight environmental issues. [1]
- (vii) Chapman's Cycle refers to the process of regeneration of ozone in the stratosphere. However, the rampant use of certain substances has interfered with the process of ozone formation. Name any two of these substances. [1]
- (viii) Write the expanded forms of the following: [2]
- (a) IPM
 - (b) NAMP
- (ix) Write a term for each of the descriptions given below:
- (a) A philosophy that examines deep connections between the domination of nature and the exploitation of women. [1]
 - (b) The technique of keeping a record of natural resources and changes in natural stocks in non-monetary units. [1]
 - (c) The process of supplying water slowly to the root zone of plants. [1]
 - (d) A type of conservation in which species are kept outside of their natural habitat. [1]

SECTION B – 28 MARKS

Question 2

[4]

- (i) What is *sustainable development*? Briefly explain *any three* of its principles.

OR

- (ii) Discuss Malthus theory of Population.

Question 3

Yuksom, the first capital of Sikkim, is located on the foothills of the Himalayas. The inhabitants of this town have adopted a sustainable approach, thereby making Yuksom one of the first towns in India to ban plastic bags. The local community has maintained its traditional ways of living and the homestays in this region provide the tourists with an authentic and rustic experience in local culture.

- (i) Identify the type of tourism practised in Yuksom. [1]
- (ii) State *any three* disadvantages of this type of tourism. [3]

Question 4

[4]

Discuss *any four* methods of Food Preservation.

Question 5

Rohan and Vikas are farmers who grow cotton in their respective farms in a village in Gujarat. Since the soil is rich and dark with decomposing roots and residual plant matter, they enjoy a good crop yield.

- (i) Which type of soil indicator has been referred to above? [1]
- (ii) One year, the standing crops in the farms of Rohan and Vikas were washed away completely in torrential rains. Rohan was disappointed and decided to migrate to the city for a job, but Vikas decided to wait for the soil to rejuvenate and be healthy again. [3]

Mention *any two* soil indicators that would enable Vikas to resume farming. Give a suitable reason for your answer.

Question 6

[4]

- (i) Explain *any four* ways by which free trade in Aquaculture has impacted the environment.

OR

- (ii) Discuss *any four* ways by which Curitiba managed its traffic problem and became a role model to the world.

Question 7

[4]

Discuss *any two* advantages and *any two* disadvantages of Gross Domestic Product.

Question 8

Observe the symbols of two popular food outlets given below and answer the questions that follow:



Image A



Image B

- (i) What type of Intellectual Property Right (IPR) has been indicated by the symbols given above? [1]
- (ii) State *any three* types of Intellectual Property Rights (IPR), apart from the one indicated by the symbols. [3]

SECTION C – 28 MARKS

Question 9

Since British rule in India, most forest dwellers were denied rights to their traditional forest lands. Some of them were even classified as 'encroachers' on their own land. After many years of agitation, a landmark legislation was passed by the government that sought to restore the rights of forest dwellers.

- (i) Which 'landmark legislation' has been referred to above? [1]
- (ii) Discuss *any three* ways in which this 'landmark legislation' addressed the conflict between the tribal communities and the government. [3]
- (iii) Briefly explain *any three* disadvantages of Social Forestry Programme. [3]

Question 10

- (i) The population of birds inhabiting the dense forests of Coorg in Karnataka is large as compared to the population of elephants in the same forests.
 - (a) Identify and briefly explain the types of survivorship curves represented by the species mentioned above. [2]
 - (b) State *any one* reason for the survivorship pattern followed by each of the species mentioned above. [2]
- (ii) What is *demographic transition*? Briefly explain *any two* stages of demographic transition. [3]

OR

- (i) Given below is an extract from the book, *Turtle Island*:

'I pledge allegiance to the soil
of Turtle Island,
and to the beings who thereon dwell
one ecosystem
in diversity
under the sun...'

 - (a) Who wrote the above lines? [1]
 - (b) How do the lines given above relate to the idea of Deep Ecology put forth by the poet? [3]
- (ii) State *any three* policies of the Brazilian government that led to the over exploitation of Amazonian rainforests. [3]

Question 11

- (i) A group of scientists at a meteorological department investigated the deteriorating air quality in the city. They collected random air samples from different areas of the city to find out the reasons for bad air quality.
- (a) Name *any two* air pollutants which would be present in the air samples collected by the scientists. [1]
- (b) What should be the frequency of collecting air samples? [1]
- (ii) "We town-dwellers have believed that India is to be found in its towns and not villages. Villages were created to minister to our needs. We have hardly ever paused to enquire if those poor folk get sufficient to eat and clothe themselves..." [5]
- (Source (edited): www.mkgandhi.org)

Comment on the relevance of Gandhi's ideas of self-sufficiency of villages in the context of urban migration in India.

Question 12

Read the passage given below and answer the questions that follow.

Toxic waste trade developed into a thriving business for both developed and developing nations over the years. In 1980s, it was recognised as a serious threat to environmental safety and became an international issue.

In 2006, a ship named *The Blue Lady* quietly anchored on the coast of Gujarat. The ship carried no permission as per international law to enter Indian waters. It carried hazardous waste such as asbestos. This instance was an example of the illegal export of toxic waste to India.

- (i) Which international treaty was signed to prohibit the movement of the kind of waste referred to above? Briefly discuss *any two* ways by which this treaty controls the trade of this waste. [3]
- (ii) By referring to *any two* factors, examine the growth of the trade, referred to above, between the developed countries and the developing countries. [2]
- (iii) With the help of *two* arguments, establish that this trade causes long term environmental and health hazards. [2]