

ENVIRONMENTAL APPLICATIONS

Maximum Marks: 100

Time allowed: Two hours

1. *Answers to this Paper must be written on the paper provided separately.*
 2. *You will **not** be allowed to write during the first 15 minutes.*
 3. *This time is to be spent in reading the question paper.*
 4. *The time given at the head of this Paper is the time allowed for writing the answers.*
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5. *Attempt **all** questions from Section A and **any four** questions from Section B.*
 6. *The intended marks for questions or parts of questions are given in brackets[].*

Instruction for the Supervising Examiner

Kindly read aloud the Instructions given above to all the candidates present in the Examination Hall.

This paper consists of 12 printed pages.

SECTION A (40 Marks)

(Attempt all questions from this Section.)

Question 1

Choose the correct answers to the questions from the given options.

[20]

(Do not copy the questions, write the correct answers only.)

(i) The main objective of the *Ramsar Convention* is to:

- (a) Protect the water bodies
- (b) Conserve freshwater resources
- (c) Conserve wetlands
- (d) Construct wetlands

(ii) In one half of the given picture, we can see a distinct discolouration of the Taj Mahal. Identify the main cause of the discolouration of this monument:



- (a) Chloro-Fluro Carbon gas
 - (b) Smog
 - (c) Acid rain
 - (d) Old age of this monument
- (iii) *Tarun Bharat Sangh* had helped the local people of Rajasthan to make:
- (a) Kunds
 - (b) Eris
 - (c) Khadin
 - (d) Johads

(iv) Rahul, on his birthday, gave some of his old clothes to an orphanage. The children at the orphanage were happy to get the clothes and used them.

This is an example of:

- (a) Reduce
- (b) Reuse
- (c) Recycle
- (d) Refuse

(v) Panchayati Raj is a system of governance in which gram panchayats are the basic units of administration. Select the appropriate statements regarding the functions of Panchayat:

1. Establishment of primary health centres and primary schools
2. Construction of large dams
3. Development of small and cottage industries
4. Construction of National highways

- (a) 1 and 2
- (b) 2 and 4
- (c) 3 and 4
- (d) 1 and 3

(vi) In the term *North-South* divide, North means:

- (a) Developed countries
- (b) Developing countries
- (c) European countries
- (d) United States of America

(vii) **Assertion (A):** Remote Sensing satellite is a good tool and a useful source for gathering environmental information of earth's atmosphere, ocean and land.

Reason (R): It can provide detailed information on landforms, air quality, rate of deforestation and cyclone.

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is true and (R) is false.
- (d) (A) is false and (R) is true.

(viii) Identify the type of vehicle from the image given below:



- (a) Diesel vehicle
- (b) Bio-diesel vehicle
- (c) Electric vehicle
- (d) Petrol vehicle

(ix) **Assertion (A):** Tree breaks play an important role in preventing soil erosion.

Reason (R): Deforestation leads to soil erosion.

- (a) (A) and (R) are true and (R) is the correct explanation of (A).
- (b) (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is false and (R) is true.
- (d) (A) is true and (R) is false.

- (x) Identify the correct pair.
- (a) Dastkar – Laila Tyabji
 - (b) Gandhigram - Mirra Alfassa
 - (c) Khadi – Dr. Rajendra Singh
 - (d) Auroville – Dr. Soundram
- (xi) Which of the following statements about Natural Resource Accounting (NRA) are **APPROPRIATE**?
1. NRA integrates environmental factors into national economic accounts.
 2. NRA primarily focuses on the financial value of natural resources, ignoring their ecological value.
 3. NRA helps in assessing the depletion and degradation of natural resources over time.
 4. NRA is a tool used to measure the sustainability of a nation's economic growth.
- (a) 1, 2 and 4
 - (b) 2, 3 and 4
 - (c) 1, 3 and 4
 - (d) 1, 2 and 3
- (xii) Wind Energy _____.
- (a) requires fuel
 - (b) requires wind farms that need very less area for installation
 - (c) is eco-friendly
 - (d) is available all the time

- (xiii) Identify the technology employed by the native inhabitants of a country.
- (a) Modern technology
 - (b) Appropriate technology
 - (c) Indigenous technology
 - (d) Digital technology
- (xiv) What is the primary goal of recharging ground water aquifers?
- (a) To store water in tanks for later use.
 - (b) To restore ground water level by increasing infiltration.
 - (c) To transport water across regions.
 - (d) To irrigate crops using underground pipelines.
- (xv) Which of the following statements about *National Debt* is **TRUE**?
- (a) National debt is the total amount of money borrowed by a country's government that must be repaid.
 - (b) National debt includes the money borrowed by industrialists of a country.
 - (c) National debt has no impact on the country's economy.
 - (d) National debt is always considered a negative factor for a country's development.
- (xvi) Identify the **INCORRECT** statement with reference to water recycling.
- (a) It helps to reduce the demand for fresh water.
 - (b) Recycled water can be used for drinking purposes.
 - (c) It helps to conserve natural ecosystems by reducing water extraction.
 - (d) Treated wastewater can be reused for agricultural purposes.

(xvii) *Run-off River system* is an eco-friendly technology for generating hydro-electricity. State the correct sequence of steps for generation of electricity using Run-off River System.

1. Penstock
2. Weir
3. Generator
4. Turbine
5. River

- (a) 5, 4, 2, 1, 3
- (b) 2, 3, 5, 4, 1
- (c) 2, 1, 4, 3, 5
- (d) 1, 2, 4, 3, 5

(xviii) What is a common method to *reuse organic waste* from homes and restaurants?

- (a) Composting to create nutrient-rich soil
- (b) Incinerating the waste
- (c) Packaging the waste for landfill disposal
- (d) Diluting and releasing the waste into water bodies

(xix) Identify the alternate fuel which is produced from waste materials:

- (a) Biogas
- (b) Hydrogen
- (c) Compressed Natural Gas
- (d) Liquid Petroleum Gas

- (xx) Which of the following human activities does **NOT** contribute to soil erosion?
- (a) Deforestation
 - (b) Overgrazing by livestock
 - (c) Planting trees
 - (d) Building roads

Question 2

- (i) Suggest *any two* methods to prevent *siltation* in waterways. [2]
- (ii) How can lane management manage the traffic effectively? [2]
- (iii) State *any three* reasons for rainwater harvesting in metropolitan cities. [3]
- (iv) Mention *any three* limitations of the usage of conventional sources of energy in power sector. [3]

Question 3

- (i) Mention *any two* economic strategies to reduce air pollution. [2]
- (ii) *Hybrid vehicles are new age vehicles*. Why are they called hybrid? Give *one* example of a hybrid vehicle. [2]
- (iii) [3]



Study the image of a Landfill given above.

Identify *any three* potential environmental impacts of this waste treatment practice.

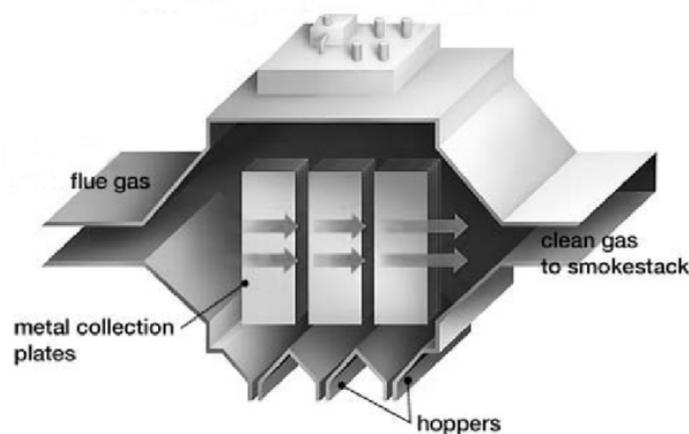
- (iv) *Women's rights are necessary for gender equality and women empowerment.* [3]
Mention *any three* roles of NGOs fighting for Women's rights.

SECTION B (60 Marks)

(Answer any four questions from this Section.)

Question 4

- (i) [5]



- (a) Identify the air pollution control device shown above.
- (b) Explain the function of the device in reducing air pollution.
- (c) Describe how the device works.
- (ii) A school in a remote area is planning to install a Dry Compost Toilet (DCT), as the school has limited access to water. The school's gardener plans to use the compost produced in the school garden. [5]
- (a) Explain how a DCT works.
- (b) Write *any two* benefits of the compost produced in the toilets to the school garden.
- (iii) Delhi is the city with the highest pollution level in India. Explain *any five* [5]
measures taken by the concerned authorities to reduce air pollution in the city.

Question 5

- (i) Deforestation is occurring at an alarming rate, causing environmental problems. [5]
Suggest *any five* methods to combat deforestation.
- (ii) *Increase in Gross Domestic Product (GDP) will bring about economic growth and this in turn will reduce poverty.* [5]
Analyse, why higher GDP and economic growth might not always result in poverty reduction.
- (iii) State *any five* initiatives that can be taken by you to conserve energy and natural resources. [5]

Question 6

- (i) Explain *any five* ways in which globalisation will help a developing country like India. [5]
- (ii) Cyclone Phailin (2013) was one of the strongest storms to hit India. Remote Sensing Satellite (RSS) helped in saving lives of over 1 million people who were evacuated from coastal areas. [5]
Explain *any five* ways how Remote Sensing Satellite (RSS) lowers the death toll.
- (iii) An Effluent Treatment Plant is designed to treat wastewater from a manufacturing facility before it is discharged into the environment. [5]
- (a) Name the *three* key steps in an Effluent Treatment Plant.
- (b) State the impact on the second step of an Effluent Treatment Plant if its first step does not function properly.

Question 7

- (i) Thanjavur District, known as the '*Rice Bowl of Tamil Nadu*', has an extensive network of Eris. [5]
- (a) What is *Eri system*?
- (b) Explain *any three* benefits of the Eri system in rice cultivation of Thanjavur.
- (ii) *Curitiba is often described as the most sustainable city in the world. It is largely a result of work by the visionary planner the Mayor, Jamie Lerner, who gave highest priority to the traffic management of Curitiba.* [5]



Mention the different types of buses used in Curitiba as shown in the image above.

- (iii) *Wetlands are highly productive ecosystem and maintain the ecological balance.* [5]
- With reference to the statement, mention *any five* importance of wetlands.

Question 8

- (i) *Kanchipuram weaving industry incorporates both traditional techniques and modern technologies.* In this context state: [5]
- (a) *Any three* advantages of Indigenous weaving.
- (b) *Any two* advantages of modern mechanised weaving.
- (ii) What is the scope of alternative sources of energy in addressing current environmental challenges? Name *any two* specific alternative energy sources. [5]

- (iii) Consider a proposed large scale infrastructure project, such as the construction of a new highway, which requires Environmental Impact Assessment (EIA). [5]

Write any five roles that EIA can play in this project.

Question 9

- (i) [5]



A city is considering building a waste incineration plant (as shown in above image) to manage its growing waste problem. However, some residents are concerned about the environmental and health impacts of burning waste.

- (a) Explain how incineration works as a waste management technique.
- (b) Describe any two potential benefits of incineration plant.
- (c) Discuss any two environmental and health concerns associated with waste incineration.
- (ii) Auroville is a township founded in 1968 in Tamil Nadu, where people from all nations live together in harmony. [5]
- (a) What are the two key ideals of Auroville?
- (b) How does Auroville contribute to such ideals?
- (iii) Check dams have transformed Ralegaon Siddhi, a village in Maharashtra. [5]
- Explain any five ways by which check dams have changed the lives of the villagers of Ralegaon Siddhi.