

Ph.D. ENTRANCE EXAMINATION, APRIL 2022
ENVIRONMENTAL SCIENCE

Time : Two Hours

Maximum : 100 Marks

- *Part A contains objective type questions with multiple choices. Each question carries 2 marks. There will not be negative marks.*
- *Part B is the descriptive type with short answer and essay type questions.*
- *Answers to Parts A and B should be made in the answer sheets provided.*

Part A

1. Why is ecology considered a multidisciplinary study ?
 - (a) It deals with the environment, which involves all kinds of interrelationships.
 - (b) It is the study of different kinds of organisms.
 - (c) It is the study of interactions of organisms.
 - (d) None of the above.
2. Which is the smallest ecological object ?
 - (a) Rabbit.
 - (b) Elephant.
 - (c) Ecosystem.
 - (d) Population.
3. How many of the Hot spots of Biodiversity recognised worldwide are situated in India ?
 - (a) 1.
 - (b) 2.
 - (c) 3.
 - (d) 03.
4. The average residence time of water in the ocean is :
 - (a) 3.5 years.
 - (b) 3.5 million years.
 - (c) 35 years.
 - (d) 3000 years.
5. The major share of IR that Carbon dioxide absorbs is in the range of _____.
 - (a) 5.5 and 7 microns.
 - (b) Greater than 27 microns.
 - (c) 15 microns.
 - (d) 0.1 to 30 microns.

Turn over

6. Assertion (A) : Chlorofluorocarbons deplete ozone; Reason (R): These are organic compounds that contain Chlorine, Bromine and Fluorine.
- (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, but (R) is false.
 - (d) (A) is false, but (R) is true.
7. Which among the following is the cleanest source of energy ?
- (a) Hydropower.
 - (b) Fossil fuel.
 - (c) Nuclear power.
 - (d) Wind energy.
8. Acid rain is caused by :
- (a) CO and CO₂.
 - (b) SO₂ and O₂.
 - (c) SO₂ and NO₂.
 - (d) NO₂ and O₂.
9. What will be the outcome of the eutrophication of surface waters ?
- (a) Overproduction of biomass.
 - (b) Decrease in nitrogen concentration.
 - (c) Decrease in phosphorus concentration.
 - (d) Decrease in both nitrogen and phosphorus concentrations.
10. A management tool comprising a systematic, periodic and objective evaluation of how well an environmental organization, management and equipment are performing is known as :
- (a) Raw material balance.
 - (b) Input-output analysis.
 - (c) Activities at site.
 - (d) Environmental audit.

11. For matching the items in List - I with List - II, the correct order of List II should be :

*List I**List II*

- | | |
|-----------------------------|---|
| (a) Montreal Convention | (i) Ozone depletion. |
| (b) Rio - Summit | (ii) Greenhouse gas. |
| (c) Ramsar Convention | (iii) Convention on Biological diversity. |
| (d) Kyoto Protocol | (iv) Wetlands convention. |
| (a) (iii), (ii), (i), (iv). | (b) (iv), (iii), (i), (ii). |
| (c) (ii), (iii), (iv), (i). | (d) (i), (ii), (iv), (iii). |

12. The least preferred technique in the disposal of municipal solid waste is :

- | | |
|-------------------|------------------|
| (a) Incineration. | (b) Composting. |
| (c) Landfilling. | (d) Bricketting. |

13. Which is (are) the fundamental characteristic(s) of a stable ecosystem ?

- | | |
|------------------------------|---------------------------|
| (a) High Biodiversity. | (b) Different life-forms. |
| (c) Vertical stratification. | (d) All the above. |

14. When you go shopping, what are you expected to do to save the environment ?

- | |
|---|
| (a) Shop for products that have as little packaging as possible. |
| (b) In any store, take a bag from the shop even it is not needed. |
| (c) Do not reduce the frequency of shopping. |
| (d) Buy paper towels and napkins. |

(d) All the above.

18. The increasing concentration of a toxic substance in the tissues of organisms at successively higher levels of the food chain is known as :
- (a) Biomagnification. (b) Bioaccumulation.
(c) Biodilution. (d) Bioconcentration.
19. Which country has the most significant number of nuclear power plants on a per capita basis ?
- (a) England. (b) The US.
(c) Spain. (d) France.
20. A symbiotic relationship between two living organisms in which one organism benefits and the other is neither harmed nor helped is known as :
- (a) Commensalism. (b) Predation.
(c) Parasitism. (d) Mutualism.
21. Earthworms are a type of :
- (a) Scavenger. (b) Soil producer.
(c) Detritivore. (d) Omnivore.
22. Which List shows the layers of the atmosphere in order, starting with the layer closest to earth ?
- (a) Stratosphere, Troposphere, Mesosphere, Thermosphere.
(b) Troposphere, Stratosphere, Mesosphere, Thermosphere.
(c) Stratosphere, Troposphere, Thermosphere, Mesosphere.
(d) Troposphere, Thermosphere, Mesosphere, Stratosphere.
23. Which of the following is very essential for the sustainability of megaprojects ?
- (a) Environment Impact Assessment. (b) Auditing.
(c) Environment Assessment. (d) Proper financial management.

24. Customary laws are more 'private client oriented', but environment laws are.
- (a) Constitutional.
 - (b) Industry-oriented.
 - (c) Give more emphasis on public needs and environment safety.
 - (d) Always for controlling pollution.
25. Which of the following is NOT a health impact of noise pollution ?
- (a) Increase in Blood Pressure.
 - (b) Metal disturbance.
 - (c) Hearing Impairment.
 - (d) Hyperacidity.

(25 × 2 = 50 marks)

Part B

Answer any eight questions.

Each question carries 5 marks.

- 26. Explain the necessity of EIA in hydroelectric power projects.
- 27. Distinguish between Ecology and Environment Science.
- 28. Explain tertiary water treatment.
- 29. Compare and contrast in situ and ex-situ conservation.
- 30. Explain the role of the Environment Management System (EMS) in an institution briefly.
- 31. Briefly discuss the significance of the Future Earth Programme.
- 32. Write about the post-independent environment laws of India.
- 33. What is eutrophication ? How can it be controlled ?
- 34. Explain Ozone depletion and its environmental impact.
- 35. What was the main theme of the Tbilisi conference ? What is its significance today ?

36. Critically analyse the environmental costs and benefits of GM crops.
37. Distinguish between National Parks and Biosphere reserves. Give examples for each.

(8 × 5 = 40 marks)

*Answer any **one** question.*

The question carries 10 marks.

38. Outline the UN organisations involved and their measures so far to control global warming ?
39. Explain the roles and activities of the IUCN. What are the different IUCN categories of red-listed species for conservation.
40. Write elaborately on different kinds of solid wastes and their scientific management.

(1 × 10 = 10 marks)