

Signature and Name of Invigilator

1. (Signature) _____

(Name) _____

2. (Signature) _____

(Name) _____

Answer Sheet No. :

(To be filled by the Candidate)

Roll No.

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(In figures as per admission card)

Roll No. _____

(In words)

Test Booklet No.

D-8905

PAPER – II

Time : 1¼ hours] ENVIRONMENTAL SCIENCE [Maximum Marks : 100

Number of Pages in this Booklet : 8

Number of Questions in this Booklet : 50

Instructions for the Candidates

- Write your roll number in the space provided on the top of this page.
- This paper consists of fifty multiple-choice type of questions.
- At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
 - To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.
 - Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the question booklet will be replaced nor any extra time will be given.**
 - After this verification is over, the Serial No. of the booklet should be entered in the Answer-sheets and the Serial No. of Answer Sheet should be entered on this Booklet.
- Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the oval as indicated below on the correct response against each item.

Example : (A) (B) (C) (D)

where (C) is the correct response.
- Your responses to the items are to be indicated in the Answer Sheet given **inside the Paper I booklet only**. If you mark at any place other than in the ovals in the Answer Sheet, it will not be evaluated.
- Read instructions given inside carefully.
- Rough Work is to be done in the end of this booklet.
- If you write your name or put any mark on any part of the test booklet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
- You have to return the test question booklet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall.
- Use only Blue/Black Ball point pen.
- Use of any calculator or log table etc., is prohibited.
- There is NO negative marking.

परीक्षार्थियों के लिए निर्देश

- पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए।
- इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं।
- परीक्षा प्रारम्भ होने पर, प्रश्न-पुस्तिका आपको दे दी जायेगी। पहले पाँच मिनट आपको प्रश्न-पुस्तिका खोलने तथा उसकी निम्नलिखित जाँच के लिए दिये जायेंगे जिसकी जाँच आपको अवश्य करनी है :
 - प्रश्न-पुस्तिका खोलने के लिए उसके कवर पेज पर लगी कागज की सील को फाड़ लें। खुली हुई या बिना स्टीकर-सील की पुस्तिका स्वीकार न करें।
 - कवर पृष्ठ पर छपे निर्देशानुसार प्रश्न-पुस्तिका के पृष्ठ तथा प्रश्नों की संख्या को अच्छी तरह चेक कर लें कि ये पूरे हैं। दोषपूर्ण पुस्तिका जिनमें पृष्ठ/प्रश्न कम हों या दुबारा आ गये हों या सीरियल में न हों अर्थात् किसी भी प्रकार की त्रुटिपूर्ण पुस्तिका स्वीकार न करें तथा उसी समय उसे लौटाकर उसके स्थान पर दूसरी सही प्रश्न-पुस्तिका ले लें। इसके लिए आपको पाँच मिनट दिये जायेंगे। उसके बाद न तो आपकी प्रश्न-पुस्तिका वापस ली जायेगी और न ही आपको अतिरिक्त समय दिया जायेगा।**
 - इस जाँच के बाद प्रश्न-पुस्तिका की क्रम संख्या उत्तर-पत्रक पर अंकित करें और उत्तर-पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें।
- प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (A), (B), (C) तथा (D) दिये गये हैं। आपको सही उत्तर के दीर्घवृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है।

उदाहरण : (A) (B) (C) (D)

जबकि (C) सही उत्तर है।
- प्रश्नों के उत्तर **केवल प्रश्न पत्र I के अन्दर दिये गये** उत्तर-पत्रक पर ही अंकित करने हैं। यदि आप उत्तर पत्रक पर दिये गये दीर्घवृत्त के अलावा किसी अन्य स्थान पर उत्तर चिन्हंकित करते हैं, तो उसका मूल्यांकन नहीं होगा।
- अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें।
- कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें।
- यदि आप उत्तर-पुस्तिका पर अपना नाम या ऐसा कोई भी निशान जिससे आपकी पहचान हो सके, किसी भी भाग पर दर्शाते या अंकित करते हैं तो परीक्षा के लिये अयोग्य घोषित कर दिये जायेंगे।
- आपको परीक्षा समाप्त होने पर उत्तर-पुस्तिका निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद अपने साथ परीक्षा भवन से बाहर न लेकर जायें।
- केवल नीले/ काले बाल प्वाइंट पेन का ही इस्तेमाल करें।**
- किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है।
- गलत उत्तर के लिए अंक नहीं काटे जायेंगे।

ENVIRONMENTAL SCIENCE

PAPER – II

Note : This paper contains **fifty** (50) multiple-choice questions, each question carrying **two** (2) marks. Attempt **all** of them.

- Air quality standards are based on :
(A) Climate and topography (B) Ambient air quality alone
(C) Dose of a pollutant (D) Method of measurement
- The unleaded petrol, as an automotive fuel, should not have the lead levels exceeding :
(A) 0.05 g/L (B) 0.15 g/L (C) 0.25 g/L (D) 0.50 g/L
- A major part of air pollution load lies in :
(A) Troposphere (B) Stratosphere (C) Thermosphere (D) Ionosphere
- Which is the correct order of the degree of weathering of the following rocks :
(A) Dunite > Basalt > Granite > Rhyolite
(B) Basalt > Dunite > Granite > Rhyolite
(C) Granite > Basalt > Dunite > Rhyolite
(D) Rhyolite > Granite > Dunite > Basalt
- Interior of the earth is inferred through :
(A) Deep continental drilling (B) Deep ocean drilling
(C) Seismic soundings (D) Heat flow measurements
- The minimum thickness to be used in biodegradable carry bags should be :
(A) 5 microns (B) 10 microns (C) 15 microns (D) 20 microns
- The criteria indicators of water pollution are :
(A) pH, COD, BOD, DO (B) pH, Coliform, COD, DO
(C) Coliform, COD, BOD (D) BOD, DO, Coliform
- The cation exchange capacity of silty loams is :
(A) 0–1 (B) 1–5 (C) 5–15 (D) 15–30
- Air Pollution Tolerance Index (APTI) of vegetation is calculated using :
(A) Pb content, SO₂ content and NO_x content in air
(B) Ascorbic acid, total chlorophyll and pH of water content on vegetation
(C) SPM, pH of water and soil types of the area
(D) Landscape of the area ; SO₂ and NO_x levels in air
- The state having the largest forest cover in India is :
(A) Andhra Pradesh (B) Orissa (C) Maharashtra (D) Chattisgarh
- Coal mine workers are prone to victims of one of the following diseases :
(A) Pneumoconiosis (B) Byssinosis (C) Asbestosis (D) Silicosis
- The number of oxygen molecules required for the complete combustion of 1 molecule of propane is :
(A) 2 (B) 3 (C) 4 (D) 5

13. Which one of the following is necessary for the growth and maintenance of animal bones and teeth :
 (A) Hydrogen (B) Oxygen (C) Phosphates (D) Sulphur
14. Which of the following organisms are used as components of biofertilisers :
 (A) Blue green algae only (B) Coliform bacteria and mushrooms
 (C) N-fixing bacteria only (D) Blue green algae and N-fixing bacteria
15. Which one of the following photochemical reactions is correct :
 (A) $\text{SO}_2 \xrightarrow{h\nu} \text{SO}_2^*$ (B) $\text{N}_2\text{O} + h\nu \longrightarrow \text{N}_2 + \text{O}^*$
 (C) $\text{O}_3 + h\nu \longrightarrow \text{O} + \text{O}_2$ (D) $\text{O}_2 + h\nu \longrightarrow \text{O}_2 + e$
16. **Assertion (A) :** CFCs destroy ozone molecules in stratosphere
Reason (R) : CFCs have very high global warming potential
 (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 ; (R) is false
 (D) (A) is false ; (R) is true
17. Match the Lists I and II. Select the correct answer using the code given below the lists :
- | List - I | List - II |
|---|------------|
| (a) Environmental Protection Act | (i) 1991 |
| (b) Air (Prevention and Control of Pollution) Act | (ii) 1974 |
| (c) Water (Prevention and Control of Pollution) Act | (iii) 1981 |
| (d) Public Liability Insurance Act | (iv) 1986 |
- Code:**
- | | | | | |
|-----|-------|-------|------|-------|
| (A) | (i) | (ii) | (iv) | (iii) |
| (B) | (iv) | (iii) | (ii) | (i) |
| (C) | (ii) | (iv) | (i) | (iii) |
| (D) | (iii) | (i) | (ii) | (iv) |
18. 2 ppm of CO at 25°C and 760mm of Hg pressure is equivalent to :
 (A) 1250 $\mu\text{g}/\text{m}^3$ (B) 1145 $\mu\text{g}/\text{m}^3$
 (C) 2500 $\mu\text{g}/\text{m}^3$ (D) 2290 $\mu\text{g}/\text{m}^3$
19. 1 kW-hour of energy is equivalent to :
 (A) 460 KCal (B) 1250 KCal (C) 860 KCal (D) 760 KCal
20. The dominant gas in biogas is :
 (A) CH_4 (B) C_2H_5 (C) CO_2 (D) NO_2

21. Match the following lists I and II and select the correct answer using the code given below the lists :

List - I		List - II	
(a)	Fluvial	(i)	Moraines
(b)	Shallow Marine	(ii)	Loess
(c)	Glacial	(iii)	Oxbow lake
(d)	Eolian	(iv)	Spits and Bar

Code:	(a)	(b)	(c)	(d)
(A)	(iii)	(iv)	(i)	(ii)
(B)	(i)	(ii)	(iii)	(iv)
(C)	(iv)	(iii)	(ii)	(i)
(D)	(iii)	(iv)	(ii)	(i)

22. Which of the following pairs is *not* correctly matched :

(A)	Tropical zone	-	Hot, winterless
(B)	Sub-tropical zone	-	Hot with cool winter
(C)	Temperate zone	-	Warm summer with pronounced winter
(D)	Alpine zone	-	Long summer with short severe winter

23. The hydraulic conductivity or the coefficient of permeability of which of the following media is the highest :

(A)	Clay	(B)	Sand	(C)	Gravel	(D)	Sandstone
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24. Aquatic organisms are very sensitive to :

(A)	Salinity	(B)	pH	(C)	Temperature	(D)	Dissolved oxygen
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25. Which of the following acts as a trigger for a landslide to occur :

(A)	Vegetation loss	(B)	Rainfall
(C)	Animal movement	(D)	Vehicular movement

26. After sodium chloride, which of the following compounds has the maximum concentration in sea water :

(A)	Magnesium sulphate	(B)	Calcium sulphate
(C)	Magnesium chloride	(D)	Potassium sulphate

27. The directions for the regulation, prohibition or the closure of any industry are given by :

(A)	State government	(B)	Central government
(C)	State Pollution Control Board	(D)	Central Pollution Control Board

28. Match the lists I and II. Select the correct answer using the code given below the lists :

List - I		List - II	
(Category of Area)		(Daytime Noise standards in dB)	
(a)	Commercial area	(i)	75
(b)	Residential area	(ii)	50
(c)	Industrial area	(iii)	65
(d)	Silence zones	(iv)	55

Code:	(a)	(b)	(c)	(d)
(A)	(i)	(ii)	(iv)	(iii)
(B)	(iii)	(iv)	(i)	(ii)
(C)	(iv)	(iii)	(ii)	(i)
(D)	(ii)	(i)	(iv)	(iii)

29. Which of the following sets has the maximum dispersion :
- (A) 10, 11, 12, 10, 11, 10, 10, 11, 10, 11 (B) 1, 2, 1, 2, 1, 2, 1, 2, 1, 2
(C) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (D) 5, 5, 6, 6, 5, 5, 6, 5, 6, 5
30. Which of the following methods is suitable for hypothesis testing :
- (A) Two way analysis of variance (B) t-test
(C) Cluster Analysis (D) Correlation and regression
31. Box model is mainly employed for analysing the :
- (A) dispersal of atmospheric pollutants
(B) Predictor and Prey populations
(C) Birth and death rates
(D) Discharge of a waste into groundwaters
32. The geometric mean of 2, 2, 3 and 3 is :
- (A) 6 (B) $\sqrt{6}$ (C) 5 (D) 1.6
33. Match the Lists I and II. Select the correct answer using the code given below the lists :
- | | | | |
|-----------------|------------------|------------------|------------------|
| List - I | | List - II | |
| (a) | Tropical forest | (i) | Sunderbans |
| (b) | Conifer forest | (ii) | Himachal Pradesh |
| (c) | Mangroves | (iii) | Rajasthan |
| (d) | Deciduous forest | (iv) | Silent valley |
- Code:**
- | | | | | |
|-----|------|------|------|-------|
| (A) | (i) | (ii) | (iv) | (iii) |
| (B) | (ii) | (i) | (iv) | (iii) |
| (C) | (i) | (iv) | (ii) | (iii) |
| (D) | (iv) | (ii) | (i) | (iii) |
34. Imhoff tank is used for :
- (A) Filtration and Flocculation (B) Sludge digestion and sedimentation
(C) Demineralization (D) Distillation
35. A solar cell is basically a :
- (A) p type semiconductor (B) n type semiconductor
(C) p-n diode (D) p-n-p transistor
36. The information system useful to identify the location of a point is :
- (A) GIS (B) GPS (C) Clinometer (D) Compass
37. The global warming potential of N₂O relative to CO₂ is :
- (A) 25 (B) 10,000 (C) 0.5 (D) 230
38. The size distribution of aerosols in ambient urban environment tends to follow :
- (A) Normal distribution (B) Exponential distribution
(C) Junge's distribution (D) Poisson distribution

39. The temperature required to fuse Deuterium and Tritium nuclei is of the order of :
 (A) $\sim 10^5$ °k (B) $\sim 10^8$ °k (C) $\sim 10^4$ °k (D) $\sim 10^6$ °k
40. Landfill sites can be permitted in :
 (A) wetlands
 (B) flood plains
 (C) habitats of endangered species and recharge zones for local drinking water supplies
 (D) abandoned mines with impermeable barrier at the bottom with a leachate recycling system
41. The satellite which has been put into orbit recently capable of producing high resolution thematic data is :
 (A) IRS - 2D (B) EDUSAT (C) RESOURCESAT (D) LANDSAT
42. The atmosphere is chemically homogenous upto an altitude of :
 (A) 10 km (B) 30 km (C) 50 km (D) 80 km
43. At which stage of an ecological succession, an ecosystem exhibits total photosynthesis equal to respiration ?
 (A) Pioneer (B) Climax (C) Virgin (D) Mid-seral
44. When in a community a species has the same abundance and density, the frequency of the species shall be :
 (A) 20% (B) 50% (C) 90% (D) 100%
45. For determination of primary productivity in a lake, which is the most appropriate time for sampling ?
 (A) 5 AM (B) 8 AM (C) 12 Noon (D) 3 PM
46. Which is the best and simple method to determination of fluorine in ground water ?
 (A) Atomic Absorption spectrometry (B) Spectrophotometry
 (C) Flame photometry (D) Ion-selective electrode

Read the passage below and answer questions that follow based on your understanding of the passage :

Forests in India are fast disappearing at a rate of about 0.6% per year equivalent to about 7.3 million ha. This renders all the closed tropical forests disappear within 177 years, At this rate of destruction of tropical forests, about 20-25% of the worlds plant species would have been lost by the year 2000. By another estimate 90% of tropical forest area containing about 505 varieties of world plant species will be destroyed during the next 20 years. By another estimate 1000 species/year would become extinct. This figure is expected to rise to 10,000 species/year. During the next 20 years, about one million species are likely to disappear.

Loss of biodiversity is severe in agricultural ecosystems too. During green revolution, thousands of wild crop varieties were replaced with a few hybrid species. This resulted in slight disappearance of genetic resources of crop plants, especially of wheat and rice. With the disappearance of the plants, the associated microorganisms and fauna were also lost. Further indiscriminate use of fertilizers and insecticides reduced the microbial species diversity live stock populations are already homogenised and their diversity is extinct.

Much of the fragile breeding and feeding grounds of almost 2/3rd of the world's oceanic fish have been destroyed. Endangered marine life in India lists about 8 species of marine mammals, 5 species of marine turtles, 1 species of hemichordate, 3 species of cephalochordate, 10 species of crab etc.

Major cause of loss of biodiversity is the expansion of agricultural practices. Biological diversity is replaced by biological uniformity or monoculture in the name of green revolution in agriculture, white revolution in dairying and blue revolution in fisheries. The purpose of all these revolutions is to ensure food security and prevent "hunger disaster".

Biodiversity is also lost due to reclamation for building dams, factories highways, mining operations etc. in the forested regions. Illegal trade and poaching of wild life also damaged biodiversity. Thus, biodiversity is destroyed by anthropogenic activities.

47. Loss of biodiversity is primarily due to :
- (A) Green revolution (B) White revolution
(C) Blue revolution (D) Mining Activity
48. Decrease in India's forest cover is attributed mainly to :
- (A) Urbanization and Industrialisation (B) Agriculture and Dairying
(C) Rail and Road Construction (D) Mining and Power Plants
49. About 90% of tropical forest area containing _____ varieties of world's plant species in the next twenty years.
- (A) 7.3 million (B) 505 (C) 10,000 (D) 1000
50. The reduction of microbial species is due to :
- (A) Mining operations (B) Application of chemical fertilizers
(C) Loss of wildlife (D) Construction of highways.

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Space For Rough Work