

Signature and Name of Invigilator

1. (Signature) _____

(Name) _____

2. (Signature) _____

(Name) _____

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Time : 1¼ hours]

PAPER - II
ENVIRONMENTAL SCIENCE [Maximum Marks : 100

OMR Sheet No. :
(To be filled by the Candidate)

Roll No.

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(In figures as per admission card)

Roll No. _____
(In words)

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 Test Booklet Number should be entered on the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
- Each item has four alternative responses marked (1), (2), (3) and (4). You have to darken the circle as indicated below on the correct response against each item.

Example : ① ② ● ④ where (3) is the correct response.
- Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only**. If you mark your response at any place other than in the circle in the OMR 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, Roll Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.
- You have to return the original OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Sheet on conclusion of examination.
- Use only Blue/Black Ball point pen.
- Use of any calculator or log table etc., is prohibited.
- There are no negative marks for incorrect answers.

परीक्षार्थियों के लिए निर्देश

- इस 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 पुस्तिका 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 चैक 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 का नंबर OMR पत्रक पर अंकित करें और OMR पत्रक का नंबर इस प्रश्न-पुस्तिका पर अंकित कर दें।
- प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (1), (2), (3) तथा (4) दिये गये हैं। आपको सही उत्तर के वृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है।

उदाहरण : ① ② ● ④ जबकि (3) सही उत्तर है।
- प्रश्नों के उत्तर केवल प्रश्न पुस्तिका के अन्दर दिये गये OMR पत्रक पर ही अंकित करने हैं। यदि आप OMR पत्रक पर दिये गये वृत्त के अलावा किसी अन्य स्थान पर उत्तर चिन्होंकित 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 OMR पत्रक पर नियत स्थान के अलावा अपना नाम, रोल नम्बर, फोन नम्बर या कोई भी ऐसा चिह्न जिससे आपकी पहचान हो सके, अंकित करते हैं अथवा अभद्र भाषा का प्रयोग करते हैं, या कोई अन्य अनुचित साधन का प्रयोग करते हैं, जैसे कि अंकित किये गये उत्तर को मिटाना या सफेद स्याही से बदलना तो परीक्षा के लिये अयोग्य घोषित किये जा सकते हैं।
- आपको परीक्षा समाप्त होने पर मूल OMR पत्रक निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद उसे अपने साथ परीक्षा भवन से बाहर न लेकर जायें। हालाँकि आप परीक्षा समाप्ति पर मूल प्रश्न-पुस्तिका तथा OMR पत्रक की डुप्लीकेट प्रति अपने साथ ले जा सकते हैं।
- 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 उत्तरों के लिए कोई नकारात्मक अंक नहीं हैं।



ENVIRONMENTAL SCIENCE
PAPER - II

Note : This paper contains **fifty (50)** objective type questions of **two (2)** marks each. **All** questions are **compulsory**.

1. Which one of the following elements contributes maximum to the earth crust by weight ?
(1) Iron (2) Silicon (3) Oxygen (4) Carbon
2. The lowest temperature is observed in which layer of the atmosphere ?
(1) Troposphere (2) Stratosphere (3) Mesosphere (4) Thermosphere
3. Which of the following gases has the lowest residence time ?
(1) CO₂ (2) N₂O (3) CFCs (4) CH₄
4. Which of the following statement is **incorrect** ?
(1) Chromium (VI) is highly toxic
(2) Methyl mercury is most toxic mercury species
(3) Arsenic (III) is more toxic than arsenic (V)
(4) Cadmium is a criteria pollutant
5. The most abundant functional group present in fulvic acid, commonly found in soils, is :
(1) Peptide group (2) Carboxylate group
(3) Phenolic group (4) Amino group
6. The source of Stratospheric NO_x is :
(1) Atmospheric N₂ (2) Tropospheric N₂O
(3) Tropospheric NO (4) Tropospheric NO₂
7. In troposphere, which of the following processes does **not** generate hydroxyl radical ?
(1) O(¹D) + H₂O (2) O(³P) + H₂O (3) HCHO + hν (4) HNO₂ + hν
8. The most common form of lead present in pesticide is :
(1) Lead acetate (2) Lead arsenate (3) Lead azide (4) Lead telluride
9. Consider the following four statements about benzo[a]pyrene :
(a) It is a group 1 carcinogen
(b) It is a polycyclic aromatic hydrocarbon
(c) Its molecular formula is C₂₀H₁₂
(d) It has four benzene rings
Choose the **correct** code :
(1) (a) and (b) only (2) (a), (b) and (c) only
(3) (b), (c) and (d) only (4) (a), (b), (c) and (d)



10. Given below are two statements. One labelled as **Assertion (A)** and the other labelled as **Reason (R)** :
Assertion (A) : Radon is an inert gas and it is radioactive.
Reason (R) : All inert gases are radioactive.
 Choose the **correct** answer :
 (1) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**.
 (2) Both **(A)** and **(R)** are correct and **(R)** is not the correct explanation of **(A)**.
 (3) **(A)** is true, but **(R)** is false.
 (4) **(A)** is false, but **(R)** is true.
11. Most of Epiphytes are examples of type of biotic interactions called :
 (1) Mutualism (2) Coevolution (3) Commensalism (4) Parasitism
12. Inhalation of airborne mold spore leads to disease in man such as :
 (1) Bronchitis (2) Allergy
 (3) Cardiac congestion (4) Eye irritation
13. Biological diversity is mainly a function of :
 (a) Latitude
 (b) Longitude
 (c) Distance from sea
 Choose the **correct** answer :
 (1) (a) only (2) (a) and (b) only (3) (b) and (c) only (4) (a), (b) and (c)
14. The ability of a living system to be restored through secondary succession after a more severe disturbance is known as :
 (1) Rehabilitation (2) Resistance (3) Resilience (4) Restoration
15. The characteristic feature of the background extinction is disappearance of a species at a :
 (1) low rate (2) fast rate (3) lapse rate (4) intrinsic rate
16. Speciation means :
 (1) Natural process of extinction of different species
 (2) Artificial process of extinction of different species
 (3) One species splits into two or more different species naturally
 (4) Characterisation of different species
17. Topological modelling is a well organized cluster of functions in GIS to process :
 (a) Spatial data
 (b) Attribute data
 (c) Physico - chemical data
 (d) Species richness data
 Choose the **correct** code :
 (1) (a) and (b) only (2) (b) and (c) only
 (3) (a), (b) and (c) only (4) (a), (b), (c) and (d)



18. A rock body or formation which may be porous enough to hold enough quantity of water but which by virtue of its other properties does not allow an easy and quick flow through it, is called :
 (1) Aquitard (2) Aquifuge (3) Aquiclude (4) Aquifer
19. For many decades, geologists noted the high number of earthquakes and active volcanoes occurring around the rim of the Pacific Ocean basin. This is called :
 (1) Volcanic ring (2) Ring of fire
 (3) Earthquake zone (4) Volcanic hot spot
20. Inversion that occurs near Earth's Surface is called :
 (1) Radiation inversion (2) Advectional inversion
 (3) Subsidence inversion (4) Cold - air - drainage inversion
21. The radiation flux emitted per unit solid angle in a specified direction by a unit area of source is called :
 (1) irradiance (2) radiance (3) exitance (4) radiant flux
22. Mean residence time of soil organic matter in an ecosystem is maximum in :
 (1) Tropical rain forest (2) Boreal forest
 (3) Temperate coniferous forest (4) Dry deciduous forest
23. Worst affected area by Indian Ocean Tsunami of December 2004 in India was :
 (1) Andaman and Nicobar Islands (2) Tamil Nadu
 (3) Andhra Pradesh (4) Odisha
24. Consider solar insolation of 400 W/m^2 incident on a single solar cell of area 100 cm^2 . If only 15% of the photons cause electron - hole pairs and the average energy of incident photons is $\sim 1 \text{ eV}$, the short circuit current of the cell is :
 (1) 1.2 A (2) 1.5 A (3) 1.6 A (4) 1.8 A
25. For which of the following renewable resources of energy, sun is not directly responsible ?
 (1) Wind (2) Biomass (3) OTEC (4) Tidal
26. In terms of the calorific value, identify the **correct** sequence :
 (1) Methane > hydrogen > ethanol > methanol
 (2) Hydrogen > methane > ethanol > methanol
 (3) Methane > hydrogen > methanol > ethanol
 (4) Hydrogen > ethanol > methane > methanol
27. At a given location the wind speeds are predominantly in the range 6 to 6.4 m/s. This location's wind power class will be termed as :
 (1) Fair (2) Good (3) Excellent (4) Outstanding



28. Which of the following nuclides does not undergo fission with low energy (slow) neutrons ?
 (1) ^{235}U (2) ^{238}U (3) ^{239}Pu (4) ^{233}U
29. According to CPCB standards, the annual average concentration of $\text{PM}_{2.5}$ should not exceed :
 (1) $60\ \mu\text{g m}^{-3}$ (2) $40\ \mu\text{g m}^{-3}$ (3) $80\ \mu\text{g m}^{-3}$ (4) $100\ \mu\text{g m}^{-3}$
30. Which of the following is a secondary aerosol ?
 (1) Pollens (2) Virus
 (3) Sodium Chloride (4) Ammonium Sulphate
31. In the colorimetric determination of ambient SO_2 by WEST-GAEKE method, the absorbance of the colored complex should be measured at which of the following wavelengths ?
 (1) 550 nm (2) 650 nm (3) 450 nm (4) 350 nm
32. A healthy human ear, before experiencing pain, can detect sound pressure levels as high as :
 (1) 50 Pa (2) 100 Pa (3) 200 Pa (4) 1000 Pa
33. The resultant of two noise levels of 80 dB and 50 dB will be about :
 (1) $\sim 80\ \text{dB}$ (2) $\sim 82\ \text{dB}$ (3) $\sim 60\ \text{dB}$ (4) $\sim 130\ \text{dB}$
34. The half life of radioactive iodine ^{131}I is :
 (1) 30 years (2) 15 years (3) 5 years (4) 8 years
35. Which of the following best describes the function of the environmental management plan as a part of the environmental statement ?
 (1) It describes the environmental impacts of the proposal.
 (2) It describes the baseline environmental data.
 (3) It describes the project proposal in detail.
 (4) It describes the actions and auditing procedures needed.
36. India submitted its INDCs related to climate change to the UN recently. What does INDCs stand for ?
 (1) Intended Nationally Devoted Contributions
 (2) Intended Nationally Determined Contributions
 (3) Intended Notified Decisive Contributions
 (4) India's Nationally Determined Contributions
37. Formal EIA became an integral part of Environmental Management in India by a Notification for the first time in :
 (1) 1988 (2) 1990 (3) 1992 (4) 1994



38. EIA is necessary because :
 (a) Development is not good for environment
 (b) Environmental impacts of development are in public interest
 (c) There is growing interest in sustainability
 Choose the **correct** answer :
 (1) (a) only (2) (b) only (3) (b) and (c) only (4) (a), (b) and (c)
39. A moist air parcel at 24°C has a mixing ratio of 10 g per kg. Its virtual temperature is :
 (1) ~ 25.81°C (2) ~ 20.68°C (3) ~ 31.25°C (4) ~ 28.12°C
40. The Vienna Convention is basically related to :
 (1) International trade in endangered species
 (2) Protection of O₃ layer
 (3) Biodiversity conservation
 (4) Preservation of cultural environment
41. According to Wildlife Protection Act in India, who is the authority to issue permission to hunt rogue animals ?
 (1) Chief Minister of the State (2) Chief Wildlife warden
 (3) Conservator of Forest (4) Deputy Commissioner
42. According to MOEF (now MOEFCC) notification of 1992, for labelling cosmetics as environment friendly product, the presence of fluoride (F) in tooth paste/powder should not exceed :
 (1) 20 ppm (2) 50 ppm (3) 100 ppm (4) 10 ppm
43. Which one of the following methods converts decomposed liquid or solid hazardous organic waste effectively ?
 (1) Open incineration (2) Plasma incineration
 (3) Sanitary landfill (4) Bioremediation
44. For a bi-variate sample, the correlation coefficient is 0.25 and it is found to be significantly different from zero at 5% level of significance. Given $t_{0.05} = 1.645$, what is the minimum size of the sample ?
 (1) 43 (2) 50 (3) 55 (4) 63
45. Which one of the following is non-probability sampling ?
 (1) Convenience probability (2) Stratified
 (3) Cluster (4) Systemic
46. A parametric test generally used to compare sample variance to a theoretical population variance, is :
 (1) F - test (2) Z - test (3) t - test (4) χ^2 - test



47. From a random sample of 36 fish caught in a sample, the mean length ($\bar{X}$) and sample standard deviation (sd) were found to be 30 cm and 6 cm respectively. If at 95% confidence level z is 1.96, then the mean length of fish in this population is in the range :
- (1) $27 < X < 33$ (2) $27.5 < X < 32.5$ (3) $24 < X < 36$ (4) $28.04 < X < 32$
48. One of the natural causes of occurrence of inland soil alkalinity is the presence of :
- (1) Sodium hypochlorite (2) Potassium nitrate
(3) Sodium chloride (4) Sodium carbonate
49. The Supreme Court of India directed the government to implement environmental education in all educational institutions as compulsory subject in :
- (1) 1976 (2) 2003 (3) 1988 (4) 2014
50. Organic wetland soils have :
- (1) high cation capacity (2) high bulk density
(3) low porosity (4) high nutrient availability

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Space For Rough Work

Prepp
Your Personal Exam Guide

