PAPER-II
ENVIRONMENTAL SCIENCE

Signature and Name of Invigilator

1. (Signature) _____

   (Name) _____

2. (Signature) _____

   (Name) _____

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

Roll No. | | | | | | | | |
(In figures as per admission card)

Roll No._____
(In words)

D 8 9 1 4

Time : **1 ¼** hours] [Maximum Marks : **100**

Number of Pages in this Booklet : **12**

Number of Questions in this Booklet : **50**

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. 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 :
   (i) 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.
   (ii) **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.**
   (iii) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
   Example : Ⓐ Ⓑ ● Ⓓ
   where (C) is the correct response.
5. Your responses to the items are to be indicated in the **OMR Sheet given inside the Paper I Booklet only.** If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. 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.
9. You have to return the test question booklet and 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.
10. **Use only Blue/Black Ball point pen.**
11. **Use of any calculator or log table etc., is prohibited.**
12. **There is no negative marks for incorrect answers.**
13. In case of any discrepancy in the English and Hindi versions, English version will be taken as final.

परीक्षार्थियों के लिए निर्देश

1. इस पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए ।
2. इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं ।
3. 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 :
   (i) 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 ।
   (ii) **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 ।**
   (iii) इस जाँच के बाद OMR पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें ।
4. प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (A), (B), (C) तथा (D) दिये गये हैं । आपको सही उत्तर के वृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है ।
   उदाहरण : Ⓐ Ⓑ ● Ⓓ
   जबकि (C) सही उत्तर है ।
5. प्रश्नों के उत्तर **केवल प्रश्न पत्र I 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 चिह्नांकित करते हैं, तो उसका मूल्यांकन नहीं होगा ।
6. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें ।
7. कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें ।
8. 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 ।
9. आपको परीक्षा समाप्त होने पर प्रश्न-पुस्तिका एवं मूल OMR पत्रक निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद उसे अपने साथ परीक्षा भवन से बाहर न लेकर जायें । हालांकि आप परीक्षा समाप्ति पर मूल प्रश्न-पुस्तिका तथा OMR पत्रक की डुप्लीकेट प्रति अपने साथ ले जा सकते हैं ।
10. **केवल नीले/काले बाल प्वाईंट पेन का ही इस्तेमाल करें ।**
11. **किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है ।**
12. **गलत उत्तरों के लिए कोई नकारात्मक अंक नहीं हैं ।**
13. यदि अंग्रेजी या हिंदी विवरण में कोई विसंगति हो, तो अंग्रेजी विवरण अंतिम माना जाएगा ।

ENVIRONMENTAL SCIENCE

Paper – II

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

1. Thermal stratification of aquatic ecosystems takes place in

(A) tropical lakes (B) temperate lakes

(C) glacier lakes (D) meandering rivers

2. The scale length of pressure variations in atmosphere in vertical direction is about

(A) 3 km (B) 4.8 km

(C) 7 km (D) 12 km

3. Which radioactive element is considered as an indoor pollutant ?

(A) Oxygen – 18 (B) Nitrogen – 15

(C) Carbon – 13 (D) Radon

4. In a closed thermodynamic system, across its boundaries

(A) no transfer of heat is possible.

(B) no transfer of work is possible.

(C) transfer of heat is possible but not of work.

(D) transfer of heat and work is possible.

5. In an urban area, moist air at 27 °C has a mixing ratio of 50 gm per kg. Its virtual temperature is

(A) 33.69 °C (B) 38.15 °C

(C) 36.15 °C (D) 32.30 °C

6. Under aerobic biodegradation of DDT, which of the following compound is formed ?

(A) DDD (B) DDE

(C) DDN (D) DDS

7. Among the following heavy metals, which has highest concentration in earth's crust ?

(A) Chromium (B) Copper

(C) Nickel (D) Zinc

8. Composition-wise halons are related to

(A) CFCs (B) Halides

(C) Hydrocarbons (D) Peptides

9. Which of the following gases has highest absorption co-efficient for solubility in water ?

(A) Hydrogen (B) Nitrogen

(C) Oxygen (D) Carbon dioxide

10. Quantity of glucose (MW 180) required to prepare 1000 ml of 5% solution is

(A) 5 g (B) 50 g

(C) 900 g (D) 9000 g

11. Endemic species are

(A) Uniformly distributed across the landscape

(B) Widely distributed

(C) Restricted to a particular area

(D) Continuously distributed globally

12. Which of the following is the <u>in-situ</u> biodiversity conservation site ?

(A) Arboretum (B) Botanical garden

(C) Biosphere reserve (D) Orchidarium

13. The largest unit of climax communities representing well defined climatic zone is referred to as

(A) Biosphere (B) Biome

(C) Biota (D) Landscape

14. An active, adaptive control process which is able to maintain the overall balance is known as

(A) Bohr's Hypothesis (B) Miller Hypothesis

(C) Gaia Hypothesis (D) Kepler's Law

15. Niche of an organism is

(A) Address (B) Profession

(C) Location (D) Range

16. Out of the total fresh water volume of the frozen form constitutes

(A) 60 % (B) 70 %

(C) 80 % (D) 50 %

17. If Q = stream flow, P = precipitation, E = evapotranspiration, ΔS = net change in storage and ΔT = net underground transfers, then the basic water balance equation is

(A) $Q = (P + E) - (\Delta S + \Delta T)$

(B) $Q = (P - E) - (\Delta S + \Delta T)$

(C) $Q = (P - E) + (\Delta S + \Delta T)$

(D) $Q = (P - E) - (\Delta S - \Delta T)$

18. Particles with a diameter smaller than 0.002 mm are classed as

(A) Cobble (B) Pebble

(C) Silt (D) Colloids

19. Water storage capacity of which soil is maximum ?

(A) Sandy loam

(B) Loam

(C) Clay loam

(D) Heavy clay

20. Which among the following is not a hot desert ?

(A) Sahara (B) Kalahari

(C) Thar (D) Gobi

21. In an ideal MHD power generator, the maximum power P output varies with the velocity (u) of conducting fuel as

(A) $P_{max} \propto u$ (B) $P_{max} \propto u^2$

(C) $P_{max} \propto u^3$ (D) $P_{max} \propto u^{3/2}$

22. Which is the most efficient energy source for producing electricity ?

(A) Nuclear power

(B) Hydro power

(C) Wind power

(D) Solar power

23. Which of the following types of coal has highest water content ?

(A) Anthracite

(B) Bituminous coal

(C) Lignite

(D) Subbituminous coal

24. Energy intensity is the amount of energy

(A) produced per unit gross domestic product

(B) consumed per unit gross domestic product

(C) produced per year per unit area of the country

(D) consumed per year per unit area of the country

25. Which is the cleanest fuel for power generation ?

(A) Coal

(B) Uranium

(C) Hydrogen

(D) Water

26. The mountain that rises a kilometre or more above the surrounding sea floor is called

(A) Oceanic island

(B) Atoll

(C) Seamount

(D) Island arc

27. Which form of As is most toxic ?

(A) As^{+3} (B) As^{+2}

(C) As^{+6} (D) As^{+4}

28. Noise climate is represented by

(A) $L_{10} - L_{90}$

(B) L_{eq}

(C) L_{50}

(D) $(L_{10} - L_{90})^2 / 60$

29. The classical smog is mainly composed of

(A) NO_x and smoke particulates

(B) O_3 and SO_2

(C) SO_2 and NO_x

(D) SO_2 and smoke particulates

30. According to National Ambient Air Quality Standards the annual average concentration of SPM in a residential area should not exceed

(A) 80 $\mu g/m^3$ (B) 100 $\mu g/m^3$

(C) 140 $\mu g/m^3$ (D) 200 $\mu g/m^3$

31. "Blue baby syndrome" is caused due to intake of water high in

(A) Ammonia (B) Nitrates

(C) Sulphates (D) Sulphides

32. EIA of mining activities involve impact assessment on

I. Geological Environment

II. Biological Environment

III. Aerial Environment

Codes :

(A) I only

(B) II and III only

(C) I and III only

(D) I, II and III

33. Accreditation of Environmental Consultant Organizations in India is done by

(A) Ministry of Environment, Forest and Climate Change

(B) Central Pollution Control Board

(C) Ministry of Earth Sciences

(D) Quality Council of India

34. Life Cycle Assessment (LCA) does not include

(A) Life Cycle Inventory of the product

(B) Quantitative improvement in the process of the product

(C) Life Cycle Impact Analysis

(D) Emergency Preparedness Plan

35. A developmental project requires both environmental clearance as well as approval under

(A) Water Act, 1974

(B) Forest (Conservation) Act, 1980

(C) National Environmental Tribunal Act, 1995

(D) Air Act, 1981

36. The best practice of disposal of construction and demolition (C & D) debris is

(A) Incineration (B) Recycling

(C) Land fills (D) Solidification

37. Pyrolysis of Solid Waste refers to

(A) High temperature aerobic incineration

(B) High temperature anaerobic distillation of waste for energy generation

(C) Ambient aerobic distillation

(D) Ambient anaerobic distillation

38. Kyoto Protocol of 1997 introduced the concept of carbon trading in the year of

(A) 2000 (B) 2004

(C) 2001 (D) 2002

39. Citizen's Charter on Environment in the Constitution of India is embodied in

(A) Article 48 (B) Article 48A

(C) Article 49A (D) Article 51A

40. United Nation's Conference on Environment and Development was held in

(A) December, 1993 (B) June, 1992

(C) December, 1995 (D) November, 1996

41. The geometric mean of the numbers 4, 6 and 9 is

(A) 6 (B) 8

(C) 5 (D) 7

42. A complete enumerate of all items in the population is

(A) Unrestricted sampling

(B) Non-probability sampling

(C) Census

(D) Sample survey

43. The term 'parameter' is an attribute associated with the data pertaining to

(A) sample (B) population

(C) descriptive statistics (D) sampling technique

44. A solar cell of surface area = 5 cm^2 delivers a current of 0.1 A at 0.6 V. If the intensity of solar radiation impinging on the solar cell is 1.0 kW/m^2, the efficiency of the solar cell is

(A) 6 % (B) 3 %

(C) 30 % (D) 12 %

45. **Assertion (A) :** Living systems exposed to drought salinity and freezing show enhanced levels of osmolytes.

Reason (R) : Drought, salinity and freezing stress induce water deficit.

In the context of the two statements, which one of the following is correct ?

(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.

46. UN Decade of Education for Sustainable Development is

(A) 2000 – 2009 (B) 2005 – 2014

(C) 2010 – 2019 (D) 2020 – 2031

47. Two kinds of the values distinguished in environmental ethics are

(A) Instrumental value and intrinsic value

(B) Direct use values and social values

(C) Social values and existence value

(D) Indirect use value and aesthetic value

48. The natural sources of methyl bromide in the atmosphere is

(A) Ocean (B) Volcanoes

(C) Landslide (D) Vegetation

49. The part of an actual resource which can be developed profitably in the future is

(A) Non-renewable resources

(B) Potential resources

(C) Reserved resources

(D) Stock resources

50. Trophic state index of aquatic ecosystem is determined by the concentration of

(A) Chlorophyll-a (B) NO_3^-

(C) PO_4^{-3} (D) NO_2^-

Space For Rough Work