

**PAPER-II**  
**ENVIRONMENTAL SCIENCES**

**Signature and Name of Invigilator**

1. (Signature) \_\_\_\_\_

(Name) \_\_\_\_\_

2. (Signature) \_\_\_\_\_

(Name) \_\_\_\_\_

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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 Test Booklet Number should be entered on the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
4. 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.
5. 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.
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 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 **Black Ball point pen provided by C.B.S.E.**
11. Use of any calculator or log table etc., is prohibited.
12. There is no negative marks for incorrect answers.

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)

**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 पुस्तिका 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 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 ।
  - (iii) 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 ।
4. 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 ।
5. 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 चिह्नित 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 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 डुलीकेट प्रति अपने साथ ले जा सकते हैं ।
10. केवल C.B.S.E. द्वारा प्रदान किये गये काले बाल प्वाइंट 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 ।



## ENVIRONMENTAL SCIENCES

## Paper – II

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

1. In term of atmospheric residence times, identify the correct sequence :
  - (1)  $\text{NO}_x > \text{CF}_4 > \text{CH}_3\text{Br} > \text{CH}_3$
  - (2)  $\text{CH}_3 > \text{CH}_3\text{Br} > \text{CF}_4 > \text{NO}_x$
  - (3)  $\text{CH}_3\text{Br} > \text{NO}_x > \text{CH}_3 > \text{CH}_4$
  - (4)  $\text{CF}_4 > \text{NO}_x > \text{CH}_4 > \text{CH}_3\text{Br}$
  
2. The surface winds generally blow from the east in the areas over
  - (1) Tropical Equator zone
  - (2) Midlatitudinal zone
  - (3) High latitudinal zone
  - (4) Subtropical zone
  
3. Period (epoch) associated with the interference of human beings with nature is termed as
  - (1) Eocene
  - (2) Miocene
  - (3) Anthropocene
  - (4) Holocene
  
4. The harmonic mean of the number 5, 10 and 20 is
  - (1) ~ 2.51
  - (2) ~ 6.25
  - (3) ~ 8.57
  - (4) ~ 2.857
  
5. Choose the correct statement among the following :
  - (1) The upper asymptote of the sigmoid curve of a population represents carrying capacity.
  - (2) In 'J' form of population growth, the equilibrium level is not imposed by environmental factors.
  - (3) All population growth forms are independent of environment.
  - (4) In 'J' shaped growth curve, a relatively un-restricted growth suddenly halt only due to diapause.

6. Trophic relationship between an arbitrary number of species can best be explained using
- (1) Leslies matrix model
  - (2) Lefkovitch matrix
  - (3) Generalized Lotka-Volterra equation
  - (4) Box model
7. The length (cm) of six earthworms used in an experiment are 5.37, 5.11, 6.42, 7.26, 3.99 and 2.6. Corresponding weight (g) are 5.88, 6.35, 8.11, 8.36, 4.40 and 3.5 respectively. The relationship between length and weight of the earthworms is
- (1) -vely correlated
  - (2) +vely correlated
  - (3) non-correlated
  - (4) insignificantly correlated
8. The geometric mean of the number 1, 4 and 16 is :
- (1) 6
  - (2) 3
  - (3) 4
  - (4) 2
9. Mercury is particularly hazardous to the human health because :
- (1) As a pure metal it is soluble in water, hence can easily be absorbed through drinking water.
  - (2) It is light and volatile and so is widely dispersed through the environment.
  - (3) It bioaccumulate high up in the food chain.
  - (4) It can cause serious impact by physical contact.
10. According to the Public Liability Insurance Act, 1991, the inquiry on an application for relief is conducted by
- (1) C.E.O.
  - (2) Session Judge
  - (3) Collector
  - (4) Police Commissioner

11. Discarded paint drums, pesticide cans, CFL bulbs, tube lights, expired medicines, broken mercury thermometers, used batteries etc., generated at the household level are collected as
- (1) Household dry waste                      (2) e-waste  
(3) Domestic hazardous waste              (4) Composite waste
12. Which one of the following is a Schedule-I animal of the Wildlife (Protection) Act, 1972 ?
- (1) Ferret Badgers                              (2) Himalayan Crestless Porcupine  
(3) Bengal Porcupine                          (4) Fishing Cat
13. The effluent and emission standards for industries have been notified under ;
- (1) The Environment (Protection) Act, 1986.  
(2) Motor Vehicle Act, 1988.  
(3) The Air (Prevention and Control of Pollution) Act, 1981.  
(4) The Water (Prevention and Control of Pollution) Act, 1974.
14. Which one of the following does not belong to the EIA process ?
- (1) Establishing the baseline environmental status.  
(2) Identification, prediction and assessment of environmental impacts.  
(3) Suggesting the mitigation and compensation measures.  
(4) Implementation of EMS auditing procedures.
15. In India, the validity of EIA clearance period for a mining project is
- (1) 10 years                                      (2) 20 years  
(3) 5 years                                        (4) 30 years



21. Given below are two statements. One labelled as Assertion (A) and the other labelled as Reason (R) :

**Assertion (A) :** On combustion, natural gas produces more  $\text{NO}_x$  than coal.

**Reason (R) :** Natural gas burns at a relatively high temperature than coal.

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.
22. Given below are two statements. One labelled as Assertion (A) and the other labelled as Reason (R) :

**Assertion (A) :** Measurement of noise by a sound level meter are almost universally expressed in dB(A).

**Reason (R) :** dB(A) scale represents flat frequency response of healthy persons to an auditory stimulus.

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.
23. Groundwater pollution through chemical contamination in Ganga-Brahmaputra delta region are primarily due to

- |                             |                                |
|-----------------------------|--------------------------------|
| (1) Chromium, Lead, Arsenic | (2) Arsenic, Fluoride, Nitrate |
| (3) Cadmium, Mercury, Iron  | (4) Nickel, Zinc, Manganese    |

24. With respect to water content (%) identify the correct sequence of various types of coals.

- (1) Lignite > Sub-bituminous coal > Anthracite
- (2) Sub-bituminous coal > Lignite > Anthracite
- (3) Lignite > Anthracite > Sub-bituminous coal
- (4) Anthracite > Lignite > Sub-bituminous coal

25. In India, target for generating electric power from small hydropower projects by the year 2022 is

- (1) 5 GW (2) 10 GW  
(3) 50 GW (4) 500 GW

26. The band gap in GaAs solar cell is :

- (1) ~ 1.4 eV (2) ~ 0.7 eV  
(3) ~ 1.1 eV (4) ~ 0.6 eV

27. For a given energy and duration of exposure, the radioactivity associated with which of the following is more harmful in biological terms ?

- (1) X-rays (2) Fast neutrons  
(3) Fast protons (4) Heavy ions

28. Given below are two statements. One labelled as Assertion (A) and the other labelled as Reason (R) :

**Assertion (A) :** The main greenhouse gases other than  $\text{CO}_2$  have global warming potentials much higher than that of  $\text{CO}_2$ .

**Reason (R) :** They absorb shorter wavelengths between  $7 \mu\text{m}$  and  $13 \mu\text{m}$  which overlap with atmospheric window.

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.

29. Which among the following wetlands are under Montreux Record ?

- (1) Chilka Lake (2) Keoladeo National Park  
(3) Tso Moriri (4) Nal Sarovar

30. International year of Desert and desertification was observed in

- (1) 1996 (2) 2006  
(3) 1999 (4) 2009

31. In longitudinal zonation of stream, Rhithron refers to

- (1) Sédimentation accumulation zone (2) Head water zone  
(3) Sediment deposition zone (4) Meandering zone of the river

32. Habitat fragmentation in a forest ecosystem leads to

- (a) Reduction of species diversity  
(b) Increase in species diversity  
(c) Increase the number of habitat patch  
(d) Increase the connectivity between fragments

Choose the correct answer :

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

33. Consider the following four statements and choose the correct statement :

- (a) Warm temperature lakes are monomictic.  
(b) Warm tropical lakes are polymictic.  
(c) High altitude lakes are amictic.  
(d) Deep tropical lakes are oligomictic.

Choose the correct answer :

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



34. Which one of the following type of faults is likely to be connected with the most dangerous earthquakes ?
- (1) Transform (2) Strike-slip  
(3) Reverse dip-slip (4) Normal dip-slip
35. The drainage which has streams flowing outwards in all directions from a central elevated tract is called as :
- (1) Dendritic drainage (2) Parallel drainage  
(3) Trellis drainage (4) Radial drainage
36. The largest fresh water lake of the world is
- (1) Lake Victoria (2) Lake Superior  
(3) Lake Baikal (4) Great Bear Lake
37. For depiction of gradation in slope, which of the following method is used in GIS ?
- (1) Raster GIS (2) Vector GIS  
(3) CAD (4) CAM
38. Which of the following National Parks are declared as Tiger Reserve by National Tiger Conservation Authority of India in 2015 ?
- (1) Kanha and Ranthambhor National Parks  
(2) Sariska and Nagarhole National Parks  
(3) Dudhwa and Periyar National Parks  
(4) Kudremukh and Rajaji National Parks
39. A species selected to represent an environmental cause and symbol for a defined habitat is called :
- (1) Flagship species (2) Umbrella species  
(3) Keystone species (4) Indicator species

40. Intermediate disturbance in a community result in
- (1) Maximum number of species
  - (2) Minimum number of species
  - (3) Average number of species
  - (4) Decrease the number of species
41. Access to genetic resources and the fair and equitable sharing of benefits arising from their utilization was the main objective of
- (1) Earth Summit
  - (2) Millennium Development Goal
  - (3) Nagoya Protocol
  - (4) Montreal Protocol
42. Reducing Emission from Deforestation and Forest Degradation (REDD+) in developing countries covers activities of
- (a) Reducing emission from deforestation
  - (b) Reducing emission from forest degradation
  - (c) Conservation of forest carbon stocks
  - (d) Sustainable management of forests
- Choose the correct answer :
- (1) (a) and (b) only
  - (2) (b) and (c) only
  - (3) (b) and (d) only
  - (4) (a), (b), (c) and (d)
43. Commercial vermicomposting was done by which of the following earthworm ?
- (1) Lumbricus terrestris
  - (2) Dendrobaena rubidus
  - (3) Eisenia fetida
  - (4) Haliodrillus oculantus
44. Which aquatic macrophyte can be considered as invasive alien species ?
- (1) Lotus
  - (2) Alligator weed
  - (3) Water ferns
  - (4) Duck weed

45. Keeling curve presents the yearly variations in the concentration of
- (1) Ozone (2) Methane  
(3) Sulfur dioxide (4) Carbon dioxide
46.  $3.0 \times 10^{18}$  molecules of  $\text{NO}_2$  are present in  $1.5 \times 10^{25}$  molecules of air at  $25^\circ\text{C}$  and 1.0 atmosphere pressure. Calculate the concentration of  $\text{NO}_2$  in ppb.
- (1) 20 (2) 200  
(3) 5000 (4)  $2 \times 10^{-7}$
47. Which one of the following is not an organochlorine insecticide ?
- (1) Aldrin (2) Aldicarb  
(3) Chlordane (4) Endosulfan
48. Out of vanadium, molybdenum and iron, the metals involved in nitrogenase enzyme in nitrogen fixation in soil is/are
- (1) vanadium and molybdenum only (2) vanadium, molybdenum and iron  
(3) molybdenum only (4) vanadium only
49. The dominant carbon dioxide species in sea water in equilibrium with  $\text{CO}_2$  is :
- (1)  $\text{CO}_2(\text{g})$  (2)  $\text{CO}_2 \cdot \text{H}_2\text{O}$   
(3)  $\text{HCO}_3^-$  (4)  $\text{CO}_3^{2-}$
50. The forest in oxisol is
- (1) Tropical rainforest with wet and hot climates.  
(2) Temperate grassland with hot summer and cold winter.  
(3) Evergreen forest with cold climate.  
(4) Temperate deciduous forest with hot summer and cold winter.

**Space For Rough Work**