

Signature and Name of Invigilator

1. (Signature) _____

(Name) _____

2. (Signature) _____

(Name) _____

D-8904**PAPER – II****Time : 1¼ hours] ENVIRONMENTAL SCIENCE [Maximum Marks : 100****Number of Pages in this Booklet : 16****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 and also on the Answer Sheet given inside this booklet.
- 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.

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.****परीक्षार्थियों के लिए निर्देश**

- पहले पृष्ठ के ऊपर नियत स्थान पर तथा इस पुस्तिका के अन्दर दिये गये उत्तर पत्रक 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 उसको 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 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 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 चिन्हांकित 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.

1. Identify the correct chronological sequence (oldest to youngest) in the order of their formation :
 - (A) Pacific ocean > Atlantic ocean > Mediterranean sea > Indian ocean
 - (B) Pacific ocean > Atlantic ocean > Indian ocean > Mediterranean sea
 - (C) Atlantic ocean > Pacific ocean > Indian ocean > Mediterranean sea
 - (D) Atlantic ocean > Pacific ocean > Mediterranean sea > Indian ocean
2. Movement of individual rock masses along structural planes such as bedding, joints and faults on a slope is known as :
 - (A) debris slide
 - (B) slump
 - (C) rock slide
 - (D) soil creep
3. Make list I and list II and select the correct answer using codes given below the lists :

List I

- (a) Mid oceanic ridge
- (b) Rift valley
- (c) Island arc
- (d) Continent

List II

- (i) Alkali rich basalt
- (ii) Potash poor basalt
- (iii) Andesite
- (iv) Plateau basalt

Code :

- | | | | | |
|-----|------|------|-------|-------|
| | (a) | (b) | (c) | (d) |
| (A) | (ii) | (i) | (iv) | (iii) |
| (B) | (ii) | (i) | (iii) | (iv) |
| (C) | (i) | (ii) | (iii) | (iv) |
| (D) | (i) | (ii) | (iv) | (iii) |

4. Consider the following about the Himalayan orogeny :
- (a) The orogeny resulted from the southward movement
 - (b) The orogeny began about 25 million years ago
 - (c) The orogeny closed about 1 million years ago
 - (d) The Himalayas have a root of relatively light crustal rocks projecting into the denser mantle.

Which of the following combinations is correct ?

- (A) (a) and (b)
 - (B) (c) and (d)
 - (C) (a) and (c)
 - (D) (b) and (d)
5. A seismogram records the following types of earthquake waves.
- (a) L - waves
 - (b) P - waves
 - (c) S - waves

The correct chronological sequence of the arrival of these waves is :

- (A) (b), (c) and (a)
 - (B) (b), (a) and (c)
 - (C) (c), (a) and (b)
 - (D) (a), (b) and (c) arrive at the same time
6. Which one of the following statement is true of braided streams ?
- (A) Width of the channel is less than its depth
 - (B) Width and depth of the channel are equal
 - (C) Width of the channel is greater than its depth
 - (D) Width of the channel is unrelated to its depth

7. In which of the following frequency ranges the human ear is most sensitive to noise :
- (A) 1 - 2 KHz
 - (B) 100 - 500 Hz
 - (C) 10 - 12 KHz
 - (D) 13 - 16 KHz
8. Which of the following indices represents the background noise level in the ambient environment ?
- (A) L_{dn}
 - (B) L_{10}
 - (C) L_{90}
 - (D) L_{50}
9. Assertion (A) : Aerosols have potential for modifying the climate.
Reason (R) : Aerosols interact with both short wave and infra - red radiations
- (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 and (R) is false
 - (D) (A) is false but (R) is true
10. Which of the following grows rapidly resulting in the shrinkage of water bodies ?
- (A) Phytoplankton
 - (B) Zooplankton
 - (C) Algae
 - (D) Macrophytes

11. Which species of chromium is toxic in water ?
- (A) Cr^{+2}
 - (B) Cr^{+3}
 - (C) Cr^{+6}
 - (D) Cr^0
12. Chemical compounds having same crystal structure are called :
- (A) Polymorphic
 - (B) Pseudomorphic
 - (C) Isomorphic
 - (D) None of the above
13. Micas having an atomic structure defined as continuous sheets of tetrahedrons, sharing 3 - oxygen atoms, are called :
- (A) Inosilicate
 - (B) Phyllosilicate
 - (C) Tectosilicate
 - (D) Sorosilicate
14. Alkalinity in river waters is caused due to :
- (A) Presence of SO_4^{2-}
 - (B) Na^+ and K^+
 - (C) Cl^-
 - (D) CO_3^- and HCO_3^-

15. If the population growth follows a logistic curve, the maximum sustainable yield :
- (A) is equal to half the carrying capacity
 - (B) is equal to the carrying capacity
 - (C) depends on growth rate
 - (D) depends on the initial population
16. Fluidized - bed combustion of coal is an efficient method of controlling which of the following air pollutants :
- (A) CO
 - (B) SPM and NO_x
 - (C) NO_x and SO_x
 - (D) CO, SPM and SO_x
17. The plume rise in a coal based thermal power plant depends on :
- (a) buoyancy
 - (b) atmospheric stability
 - (c) momentum of exhaust gases
- Identify the correct combination
- (A) (a) and (b) only
 - (B) (b) and (c) only
 - (C) (a) and (c) only
 - (D) (a), (b) and (c)

18. The efficiency of a solar flat plate collector depends on :

- (a) Thermal efficiency
- (b) Optical efficiency
- (c) Solar flux

Identify the correct combination

- (A) (a), (b) and (c)
- (B) (a) and (b) only
- (C) (b) and (c) only
- (D) (a) and (c) only

19. An increase of 10 ppm in the concentration of CO₂ in atmosphere represents approximately an addition of carbon of amount :

- (A) 1.2 Kilotons
- (B) 2.12 Megatons
- (C) 21.2 Geiga tons
- (D) 2120 tons

20. Winds blowing down an incline often due to cold air drainage is called :

- (A) Anabatic winds
- (B) Mountain winds
- (C) Cyclonic winds
- (D) Katabatic winds

21. Mixing height is :

- (A) the height of ground based inversion
- (B) the height at which geostrophic balance occurs
- (C) the height of constant solar flux layer
- (D) the height upto which atmosphere is churned by convection

22. For a comprehensive EIA study, it is to be conducted for :
- (A) the whole year
 - (B) any three seasons including monsoon
 - (C) three seasons excluding monsoon
 - (D) the worst season
23. Emissions from landfills of solid waste include :
- (A) SO_2 , NO_x , SPM
 - (B) NH_4^+ , CO_2 , CO
 - (C) NH_4^+ , CO_2 , CO, H_2S , CH_4 , H_2 , N_2
 - (D) CO, CO_2 , O_3
24. In initial environmental examination, the following are considered :
- (A) No quantitative data
 - (B) Primary data
 - (C) Secondary data
 - (D) On site data for atleast a season
25. Which of the following forest types is most widespread in India ?
- (A) Tropical evergreen forest
 - (B) Tropical deciduous forest
 - (C) Temperate forest
 - (D) Scrub forest
26. The presence of pneumatophores is seen in :
- (A) Desert plants
 - (B) Climbers and lianas
 - (C) Trees of tropical moist forests
 - (D) Mangroves

27. Ramsar convention is related to conservation of :
- (A) Tiger
 - (B) Elephants
 - (C) Crop genetic diversity
 - (D) Wetlands
28. A significant effect of climate change on account of global warming on terrestrial plants will be on :
- (A) Stomatal mechanism
 - (B) Amino acid composition of cereal grains
 - (C) Phenology
 - (D) Bark formation in trees
29. A tree, which is popular in social forestry programme in India, is :
- (A) Shorea robusta
 - (B) Ailanthus excelsa
 - (C) Cedrus deodara
 - (D) Callistemon lanceolatus
30. The great Indian Rhino has its natural home in :
- (A) Kaziranga National Park
 - (B) Corbett National Park
 - (C) Sunderbans
 - (D) Kanha National Park
31. According to the Botanical Survey of India, the total number of plant species in India is about :
- (A) 45,000
 - (B) 75,000
 - (C) 17,000
 - (D) 30,000

32. Assertion (A) : Bt cotton is a transgenic crop which has been introduced in India, but is being opposed on environmental grounds.
- Reason (R) : Cry1Ac protein in Bt cotton has been found to be toxic and allergenic to human beings.
- (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 correct explanation of (A).
- (C) (A) is true but (R) is false
- (D) (A) is false but (R) is true
33. Oxygen toxicity (in humans) is caused by :
- (A) Inhalation of molecular oxygen
- (B) Generation of free radicals
- (C) Interactions of singlet oxygen with membrane
- (D) None of the above
34. $C_2F_3Cl_3$ gas :
- (A) absorbs ultraviolet radiations
- (B) affects tropospheric ozone
- (C) forms aerosols in stratosphere
- (D) absorbs infrared radiations
35. Which of the following shows bioaccumulation and contaminate food chains ?
- (A) Pesticides
- (B) Polychlorinated biphenyls
- (C) PAN
- (D) All of the above

36. Removal of which of the following impurities from contaminated water requires the use of coagulants :
- (A) Colloidal impurities
 - (B) dissolved solids
 - (C) micro organisms
 - (D) all of the above
37. Drinking water quality at source after conventional treatment and disinfection should have some of the following characteristics
- (a) Total coliform organisms (MPN/100 ml) 500 or less
 - (b) pH between 5.5 - 6.5
 - (c) dissolved oxygen 10 mg/litre or above
 - (d) B.O.D. at 20°C 3 mg/litre or less
- Identify the correct combination
- (A) (a) and (d)
 - (B) (a) and (b)
 - (C) (c) and (d)
 - (D) (a) and (c)
38. The most efficient method of biodegradable urban solid waste management is :
- (A) Landfills
 - (B) Pelletisation
 - (C) Gasification
 - (D) Composting
39. Pollutants in soil can be broken down by micro organisms. The process is called :
- (A) Probiotics
 - (B) Bioremediation
 - (C) Bioaugmentation
 - (D) None of the above

40. A thermodynamic function of state which is constant during a reversible isobaric isothermal process is :
- (A) Geothermal potential
 - (B) Thermodynamic efficiency
 - (C) Enthalpy
 - (D) Gibb's free energy
41. t - statistic is useful for testing :
- (A) Variances
 - (B) Overall goodness of fit of a regression model
 - (C) null hypothesis for a regression coefficient
 - (D) constancy of the mean
42. For a Normal distribution, the skewness is :
- (A) 1
 - (B) 0
 - (C) ∞
 - (D) $\frac{1}{2}$
43. 1 metric ton of average coal in energy terms is equivalent to :
- (A) 2000 cubic feet of natural gas
 - (B) 24000 cubic feet of natural gas
 - (C) 1.5 barrels of oil
 - (D) 2.0 barrels of oil
44. The energy release per deuteron in a Deuterium - Tritium fusion reaction is approximately :
- (A) 1.6 MeV
 - (B) 17.6 KeV
 - (C) 17.6 MeV
 - (D) 17.6 GeV

45. In marine environment Carbonate Compensation Depth (CCD) is defined as depth at which :
- (A) Carbonate begins to dissolve
 - (B) Carbonate begins to precipitate
 - (C) Bicarbonate begins to precipitate
 - (D) Bicarbonate begins to dissolve
46. In an idealised Magnetohydrodynamic power plant, the maximum power output varies with fuel velocity (u) as :
- (A) U
 - (B) U^2
 - (C) U^3
 - (D) $U^{1/2}$
47. The most commonly found ion in rain water in India is :
- (A) SO_4^{2-}
 - (B) Na^+
 - (C) K^+
 - (D) Cl^-
48. In humid climate, weathering of various types of rocks occurs. Identify the correct sequence in order of decreasing weathering :
- (A) Basalt > Dunite > Granite
 - (B) Basalt > Granite > Dunite
 - (C) Dunite > Granite > Basalt
 - (D) Dunite > Basalt > Granite

49. Match list I and list II and select the correct answer using codes given below the lists :

List I

- (a) Ozone depletion
- (b) CO₂ reduction
- (c) Sustainable development
- (d) Hazardous waste

List II

- (i) Basel convention
- (ii) Kyoto Protocol
- (iii) Rio Summit
- (iv) Montreal Protocol

Code :

- | | | | | |
|-----|------|-------|-------|------|
| | (a) | (b) | (c) | (d) |
| (A) | (i) | (iv) | (iii) | (ii) |
| (B) | (iv) | (ii) | (iii) | (i) |
| (C) | (ii) | (iii) | (iv) | (i) |
| (D) | (iv) | (iii) | (ii) | (i) |

50. The lion - tailed macaque is endemic to :

- (A) Andaman and Nicobar islands
- (B) Lakshadweep
- (C) Nilgiri
- (D) Arunachal Pradesh

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Space For Rough Work