

Signature and Name of Invigilator

1. (Signature) _____

(Name) _____

2. (Signature) _____

(Name) _____

J-8907**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.
- 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 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.

- Which of the following statement about Fjord is incorrect ?
 - Most Fjords were formed due to raise in sea level after the melting of Pleistocene ice
 - It is an emergent coast that was originally submerged
 - It is a long narrow inlet of the sea bound by steep slopes
 - It is a glaciated valley that has been inundated by the sea

- Given 'd' as particle size and 'V' settling velocity in cm/sec., the correct relationship between 'd' and 'V' is given by :
 - $V \propto \frac{1}{d^n}$
 - $V \propto d^n$
 - $V \propto d$
 - $V = \frac{1}{d^n}$

- Residence time of water molecule in the ocean is :
 - 3.5 years
 - 3.5 million years
 - 35 years
 - 35000 years

- Hyperplasia means :
 - excessive motility of a muscle
 - Voracious eating
 - Abnormal increase in number of cells
 - An increase in size of a cell

5. Carbon dioxide absorbs radiation in the range :
- (A) 5.5 and 7 microns
 - (B) Greater than 27 microns
 - (C) 8 to 13 microns
 - (D) 0.1 to 30 microns
6. Sodium is usually estimated by which of the following analytical technique :
- (A) Flame Photometry
 - (B) Coulometry
 - (C) High pressure liquid chromatography
 - (D) Visible spectrophotometry
7. Which combination of the following elements constitute a major portion of earth crust :
- (A) Oxygen and Silicon
 - (B) Oxygen and Iron
 - (C) Silicon and Iron
 - (D) Aluminium and Iron
8. **Assertion (A)** : Chlorofluorocarbons deplete ozone.
Reason (R) : These compounds contain Chlorine, Bromine and Fluorine.
- (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

9. The chemical composition of CFC-115 is :
- (A) C_2F_5Cl
 - (B) C_2FCl_5
 - (C) $CHClF_2$
 - (D) $C_2H_2F_2Cl_2$
10. Maximum Density of water is at :
- (A) $4^\circ C$
 - (B) $0^\circ C$
 - (C) $100^\circ C$
 - (D) $272^\circ C$
11. The cause of lung cancer Mesothalemia is :
- (A) Asbestos
 - (B) Arsenic
 - (C) Mercury
 - (D) Chromium
12. Which of the following pattern of evolution accounts for all the diversity present on earth today ?
- (A) Microevolution
 - (B) Megaevolution
 - (C) Biodiversity
 - (D) Speciation
13. Group of individuals of the same species that share common attributes are called :
- (A) Community
 - (B) Population
 - (C) Ecotype
 - (D) Society

14. Which one of the following is the correct food chain ?

- (A) Algae → Daphnia → Dragon Fly Nymph → Newt → Grass Snake
- (B) Daphnia → Dragon Fly Nymph → Newt → Algae → Grass Snake
- (C) Grass Snake → Newt → Dragon Fly Nymph → Daphnia → Algae
- (D) Newt → Grass Snake → Dragon Fly Nymph → Algae → Daphnia

15. Match the items in **List - I** with **List - II** and select the correct answers using codes given below :

List - I

List - II

- | | |
|----------------|--|
| (a) Fohn wind | (i) Analogous to rainbow |
| (b) Fog bow | (ii) Herbivorous plants |
| (c) Forbs | (iii) Warm winds descending from mountains |
| (d) Fore shock | (iv) Earthquake |

Code :

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

16. **Assertion (A) :** Monsoonal rainfall is very high both on the west coast and northeast India.

Reason (R) : The duration of monsoon over west coast and northeast India is longer than other parts of India.

- (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

17. Match the climatic categories in **List - II** for places in **List - I** using the codes given below :

<i>List - I</i>	<i>List - II</i>
(a) Delhi	(i) Arid
(b) Mumbai	(ii) Semi Arid
(c) Jodhpur	(iii) Moist Sub humid
(d) Shillong	(iv) Per Humid

Code :

	<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
(A)	(ii)	(iii)	(i)	(iv)
(B)	(iv)	(ii)	(iii)	(i)
(C)	(iii)	(iv)	(ii)	(i)
(D)	(i)	(ii)	(iv)	(iii)

18. Match the items in **List - I** with **List - II** and select the correct answers using codes given below :

<i>List - I</i>	<i>List - II</i>
(a) Lignite	(i) Bikaner
(b) Asbestos	(ii) Chotanagpur
(c) Titanium	(iii) Southern Malabar
(d) Iron	(iv) Ratnagiri

Code :

	<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
(A)	(i)	(ii)	(iii)	(iv)
(B)	(i)	(ii)	(iv)	(iii)
(C)	(ii)	(i)	(iii)	(iv)
(D)	(ii)	(i)	(iv)	(iii)

19. Which one of the following statements regarding ELNINO is NOT true ?
- (A) It is an extension of equatorial current towards the western coast of South America.
 - (B) It is an occasional warm current leading to an increase of about 10°C in subsurface water temperature.
 - (C) It develops as temporary replacement of usual cold Peruvian Current.
 - (D) It causes an increase in plankton thriving in cold Peruvian current.

20. The process of alluviation indicates :
- (A) Removal of particles from the upper layer of soil
 - (B) Removal of particles from lower layer of soil
 - (C) Deposition of soil particles in sub-soil layer
 - (D) Transportation of soil particles in the B-horizon

21. Which one of the following is the cleanest source of energy ?
- (A) Hydropower
 - (B) Fossil fuel
 - (C) Nuclear power
 - (D) Wind energy

22. Match the items in **List - I** with **List - II** and select the correct answer using codes given below :

<i>List - I</i>	<i>List - II</i>
(a) CFC	(i) Bhopal Gas Tragedy
(b) CO ₂	(ii) Global Warming
(c) BOD	(iii) Ozone depletion
(d) MIC	(iv) Water pollution

Code :

	<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
(A)	(iii)	(ii)	(iv)	(i)
(B)	(iv)	(iii)	(i)	(ii)
(C)	(i)	(ii)	(iii)	(iv)
(D)	(iv)	(iii)	(ii)	(i)

23. The global warming efficiency of a CFC molecule in relation to a CO_2 molecule is higher by a factor of :
- (A) 125
 - (B) 25
 - (C) 20,000
 - (D) 1500
24. Arsenic problem in India is primarily due to :
- (A) Overexploitation of arsenopyrite in the hinterland
 - (B) Overexploitation of coal in Bihar and Bengal
 - (C) Overexploitation of ground water in the affected areas
 - (D) Overexploitation of surface water in the affected areas
25. Acid rain is caused by :
- (A) CO and CO_2
 - (B) SO_2 and O_2
 - (C) SO_2 and NO_2
 - (D) NO_2 and O_2
26. What will be the outcome of eutrophication of surface waters ?
- (A) Overproduction of biomass
 - (B) Decrease in nitrogen concentration
 - (C) Decrease in phosphorus concentration
 - (D) Decrease in both nitrogen and phosphorus concentrations.
27. **Assertion (A)** : Negatively charged soil particles attract positive ions like Ca^{++} and Mg^{++}
- Reason (R)** : The attraction keeps the ions at soil level for ready availability.
- (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

28. Match the items in **List - I** with **List - II** and select the correct answer using codes given below :

<i>List - I</i>	<i>List - II</i>
(a) The audible frequency range is	(i) 20 μ Pa to 200Pa
(b) The audible sound level pressure is	(ii) 20 – 20,000 Hz
(c) Ratio of Intensity to a reference Intensity of sound expressed in log scale is	(iii) Equivalent continuous sound level (Leq)
(d) Energy content for varying sound levels	(iv) Decibel

Code :

	<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
(A)	(ii)	(i)	(iv)	(iii)
(B)	(i)	(ii)	(iii)	(iv)
(C)	(iv)	(iii)	(ii)	(i)
(D)	(iii)	(iv)	(ii)	(i)

29. Cost Benefit analysis is required in case of proposals involving clearance of forest land :

- (A) Greater than 10ha but less than 20ha
- (B) Greater than 20ha
- (C) Greater than 5ha but less than 10ha
- (D) Greater than 40ha only

30. Ecologically sensitive and important areas, breeding and spawning grounds of marine life etc., are categorized in coastal Regulation Zone as :

- (A) CRZ - IV
- (B) CRZ - II
- (C) CRZ - III
- (D) CRZ - I

31. A management tool comprising a systematic, periodic and objective evaluation of how well an environmental organization, management and equipment are performing is known as :

- (A) Raw material balance
- (B) Input - output analysis
- (C) Activities at site
- (D) Environmental audit

32. Choose right expansion of CITES of 1975 :

- (A) Centre for International Training in Endangered Species of Wild Fauna and Flora
- (B) Committee on International Trade and Environment and Sustainable Development
- (C) Council of Indian Trade and Environmental Survey of Wild Fauna and Flora
- (D) Convention on International Trade in Endangered Species of Wild Fauna and Flora

33. Match the items in **List - I** with **List - II** and select the correct answer using codes given below :

List - I

- (a) Montreal Convention
- (b) Rio - Summit
- (c) Ramsah Convention
- (d) Kyoto Protocol

List - II

- (i) Ozone depletion
- (ii) Greenhouse gas
- (iii) Convention on Biological diversity
- (iv) Wetlands convention

Code :

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

34. The least preferred technique in the disposal of municipal solid waste is :
- (A) incineration
 - (B) composting
 - (C) land filling
 - (D) bricketting
35. Bacterial decomposition of biological material under aerobic condition is :
- (A) Fermentation
 - (B) Fertilization
 - (C) Contamination
 - (D) Composting
36. When you go for shopping, what are you expected to do to save environment ?
- (A) Shop for products that have as little packaging as possible.
 - (B) In any store, use a bag even it is not needed.
 - (C) Do not reduce the frequency of shopping.
 - (D) Buy paper towels and napkins.
37. Match the items in **List - I** with **List - II** and select the correct answer using codes given below :
- | <i>List - I</i> | <i>List - II</i> |
|------------------------------------|--------------------------|
| (a) polyethylene terephthalate | (i) detergent bottles |
| (b) high density polyethylene | (ii) beverage bottles |
| (c) vinyl low density polyethylene | (iii) shampoo bottles |
| (d) polypropylene | (iv) cooking oil bottles |
- Code :**
- (A) (a) and (ii)
 - (B) (b) and (iii)
 - (C) (c) and (i)
 - (D) (d) and (iv)

38. In the analysis of 15 water samples, Ca and Mg gave a correlation of +0.95. It means :

- (A) Ca came from soil and Mg came from biota
- (B) Ca and Mg both came from the same type of water
- (C) Ca and Mg are both cogenetic
- (D) Ca and Mg came from different sources.

39. If a piece of metal weighs 10.2g in air, 8.6g in water and 7.8g in another liquid, then what will be the specific gravity of the liquid ?

- (A) 1.0
- (B) 1.5
- (C) 2.0
- (D) 3.0

40. The geometric mean of the numbers 2, 4, 8, 16, 32 is :

- (A) 12
- (B) 16
- (C) 8
- (D) 32

41. The correlation coefficient between the variables X, Y as given in the following table :

X	1	3	4	6	8	9	11	14
Y	1	2	4	4	5	7	8	9

is :

- (A) -0.977
- (B) -0.517
- (C) +0.977
- (D) +0.217

42. Climatic stress is caused by insufficient and/or excessive regime of :
- (A) Temperature
 - (B) Humidity
 - (C) Solar radiation
 - (D) All the above
43. The chemical that is used to ripen mangoes is :
- (A) Calcium sulphide
 - (B) Calcium carbide
 - (C) Calcium carbonate
 - (D) Calcium chloride
44. Which two of the following statements regarding ISO 14000 series of standards are true ? Answer choosing the code given below :
- (i) ISO 14000 standards are based on a principle assumption that better environmental management will lead to better environmental performance.
 - (ii) ISO 14000 standards are regulatory standards developed by ISO
 - (iii) ISO 14000 standards are market driven and therefore are based on voluntary involvement of all interests in the market place.
 - (iv) The adoption of ISO 14000 is a one time commitment
- (A) (i) and (ii)
 - (B) (ii) and (iii)
 - (C) (i) and (iii)
 - (D) (iii) and (iv)

45. Organisms that generate energy using light are :
- (A) oligotrophs
 - (B) chaemorganotrophs
 - (C) chaemolithotrophs
 - (D) photoautotrophs
46. Conversion of ${}_{94}^{239}\text{Pu}$ to ${}_{92}^{235}\text{U}$ involves the following types of decay :
- (A) α and β
 - (B) α and γ
 - (C) β and γ
 - (D) only β
47. Land use pattern is usually studied by the following technique :
- (A) Aerial photography
 - (B) Satellite imaging
 - (C) Satellite imaging and G. I. S.
 - (D) Satellite imaging, G. I. S. and G. P. S.
48. To conserve coral reefs the Govt. of India declared one of the following as marine park :
- (A) Gulf of Kutch
 - (B) Lakshadweep islands
 - (C) Gulf of Mannar
 - (D) Andaman Islands

49. Which one of the following does not contribute to conservation of water :
- (A) Waste water treatment
 - (B) Waste land development
 - (C) Water shed protection
 - (D) Rain water harvesting
50. Particle size in soil can be classified as clay : 1-4 micron. Silt : 4-62 micron. Sand : 62-1000 micron ; Boulder : >1000 micron. It is hence correct to suggest that in nature particle size distribution follows :
- (A) Binomial distribution
 - (B) Lognormal distribution
 - (C) Linear distribution
 - (D) Normal distribution

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Space For Rough Work