

Signature and Name of Invigilator

1. (Signature) _____

(Name) _____

2. (Signature) _____

(Name) _____

D—8906**PAPER—II****Time : 1¼ hours] ENVIRONMENTAL SCIENCE [Maximum Marks : 100****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 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 वे 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 उज्जर-पत्रक पर अंकित करें और उज्जर-पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें।
- प्रत्येक प्रश्न के लिए चार उज्जर विकल्प (A), (B), (C) तथा (D) दिये गये हैं। आपको सही उज्जर के दीर्घवृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है।

उदाहरण : (A) (B) (C) (D)

जबकि (C) सही उज्जर है।
- प्रश्नों के उज्जर **केवल प्रश्न पत्र I के अन्दर दिये गये** उज्जर-पत्रक पर ही अंकित करने हैं। यदि आप उज्जर पत्रक पर दिये गये दीर्घवृत्त के अलावा किसी अन्य स्थान पर उज्जर चिह्नंकित 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 उज्जर-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 उज्जर-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 ज्वाईंट पेन का ही इस्तेमाल करें।**
- किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है।**
- गलत उज्जर 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.

- Due to Coriolis effect, wind in the :
 - Northern Hemisphere move to the left with respect to the rotating earth.
 - Northern Hemisphere move to the right.
 - Southern Hemisphere move northward.
 - Both Hemisphere move independent of each other.
- Precipitation of CaCO_3 may occur when :
 - Sea water is shallow and CO_2 is lost.
 - Sea water is warm and CO_2 is being lost.
 - Sea water is cold and CO_2 is being lost.
 - Sea water is deep and CO_2 is being added.
- CO_2 in soil and CO_2 in atmosphere differ :
 - by a factor of 2
 - by a factor of 1
 - by a factor of 3.5
 - by a factor of 4
- Consider the earth to be a blackbody with average temperature 15°C and surface area $5.1 \times 10^{14}\text{m}^2$. Find the rate at which energy is radiated by the earth and the wave length at which maximum power is radiated.
(Hint : Stefan-Boltzman Constant = $5.67 \times 10^{-8}\text{ W/m}^2\text{-K}^4$ and use Wien's Rule)
 - $4 \times 10^{17}\text{ W}$, $2.02\ \mu\text{m}$
 - $1 \times 10^{17}\text{ W}$, $5.1\ \mu\text{m}$
 - $1.5 \times 10^{17}\text{ W}$, $7.5\ \mu\text{m}$
 - $2 \times 10^{17}\text{ W}$, $10.1\ \mu\text{m}$
- Trapping plume occurs when :
 - Temperature increases with height.
 - Temperature decreases with height.
 - Temperature remains steady with height.
 - Plume lies in a lapse region and sandwiched between inversion layers.
- The pH of a solution containing hydrogen ions concentration of 10^{-5} mol/L is :
 - 5.0
 - 7.0
 - 2.0
 - 9.0
- Malathion is :
 - Organo Phosphorus Pesticide
 - Organo Chloro Pesticide
 - Organo Carbamate Pesticide
 - Not a Pesticide

8. Critical point for water in a P - T diagram Suggests : (One statement only is correct)
- (A) Water is unstable
 (B) Steam is the only stable phase
 (C) Both ice and steam are stable phases
 (D) Steam, liquid water and ice are stable phases
9. The range of pH for river water in India is :
- (A) 1 - 14 (B) 4 - 5 (C) 6.5 - 8.0 (D) 7 - 12
10. In all fresh water in India, the dominant ion is :
- (A) HCO_3^- (B) Cl^- (C) Ca^{+2} (D) SO_4^{-2}
11. Ozone toxicity to plants is generally due to the involvement of which unsaturated hydrocarbons :
- (A) Unsaturated fatty acid (B) Methylene
 (C) Ethylene (D) None of the above
12. In vitro pollen germination is inhibited by :
- (A) SO_2 (B) O_3
 (C) Both of the above (D) None of the above
13. Which one of the following is the most productive ecosystem ?
- (A) Oligotrophic lake (B) High Sea
 (C) Estuary (D) Savanna
14. Vermiculture technology is used in :
- (A) Production of Fish (B) Animal Husbandary
 (C) Poultry Farming (D) Organic Farming
15. Which one of the following sequence represent increasing order of toxicity of metals ?
- (A) Ca, Zn, Cd, Mn (B) Ca, Mn, Zn, Cd
 (C) Zn, Mn, Cd, Ca (D) Mn, Cd, Zn, Ca
16. Energy flow in an ecosystem is :
- (A) Cyclic (B) Multidirectional
 (C) Sequential (D) Unidirectional
17. Removal of key-stone species would cause :
- (A) Drastic change in community composition
 (B) Drastic change in ecological system
 (C) Drastic change in food chain
 (D) Drastic change in energy flow

18. Match List-I and List-II and select correct answer :

<i>List - I</i>		<i>List - II</i>	
(a)	Mesozoic	(i)	Tertiary
(b)	Proterozoic	(ii)	Triassic
(c)	Cenozoic	(iii)	Pre Cambrian
(d)	Paleozoic	(iv)	Permian

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

19. Correct order of increasing energy content for various types of coal is :

- | | |
|---|---|
| (A) Anthracite, Peat, Bit-coal, Lignite | (B) Lignite, Peat, Bit-coal, Anthracite |
| (C) Peat, Lignite, Bit-coal, Anthracite | (D) Peat, Lignite, Anthracite, Bit-coal |

20. Silica content of granodiorite is in the range of :

- | | | | |
|---------------|---------------|---------------|---------------|
| (A) 22 - 44 % | (B) 66 - 88 % | (C) 44 - 56 % | (D) 44 - 66 % |
|---------------|---------------|---------------|---------------|

21. Formation of sedimentary chalcopryrite requires :

- | | |
|----------------------|---------------------|
| (A) High pH, high Eh | (B) Low pH, high Eh |
| (C) Only low Eh | (D) Low Eh, low pH |

22. Bowen's law basically tell us :

- (A) How a sedimentary rock is formed
 (B) How various igneous minerals are formed
 (C) How some economic minerals are formed
 (D) Both A and B are correct

23. Match the 24 hourly average ambient air quality standards from Lists I and Lists II :

<i>List - I</i>		<i>List - II</i>	
(a)	Sulphur dioxide	(i)	100 $\mu\text{g}/\text{m}^3$
(b)	Oxides of nitrogen	(ii)	200 $\mu\text{g}/\text{m}^3$
(c)	Suspended particulate matter	(iii)	80 $\mu\text{g}/\text{m}^3$
(d)	Respirable particulate matter	(iv)	20 $\mu\text{g}/\text{m}^3$

Codes :

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

24. The most abundant alkaline component of the atmosphere is :

- | | |
|---------------------|--------------------|
| (A) Ammonia | (B) Nitrogen |
| (C) Sulphur dioxide | (D) Carbon Dioxide |

25. The faecal indicator bacteria is :
 (A) Staphylococeus aureus (B) Streptococeus faecalis
 (C) Ercherichia coli (D) Salmonella typhi
26. The maximum permissible level of BOD (mg/l) in wastewater that is let into river is :
 (A) 20 (B) 30 (C) 40 (D) 10
27. Coral reefs are vulnerable to :
 (A) Siltation (B) Flood water (C) Nutrients (D) Salt flow
28. Assertion (A) : The mangroves are nursery ground for fish and larvae.
 Reason (R) : The mangroves are covered with mangrove plants that enriches the environment.
 (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
29. In an industrial environment what is the single most important factor in an accident prevention programme ?
 (A) A written programme (B) Training
 (C) Safety engineers (D) Management support
30. Match the following List-I and List-II and select the correct answer using the codes given below :
- | <i>List - I</i> | <i>List - II</i> |
|--|---|
| (a) Public hearing is required | (i) Modernisation of existing irrigation projects |
| (b) Public hearing is not required | (ii) Highway projects |
| (c) Baseline air quality data is collected | (iii) Once in each season |
| (d) Baseline noise level data is collected | (iv) 24 hourly twice a week |
- Codes :*
- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|-----|----------|----------|----------|----------|
| (A) | i | iv | ii | iii |
| (B) | ii | i | iv | iii |
| (C) | iii | i | iv | ii |
| (D) | iv | iii | i | ii |
31. All lands with tree cover of canopy density of 40% and above is notified as :
 (A) Scrub (B) Open forest (C) Dense forest (D) Forest cover

32. Match the List-I and List-II and select the correct answer using the codes given below :

List - I

(Power generation capacity)

- (a) 500 MW and more
 (b) 200/210 MW and above but less than 500 MW
 (c) less than 200/210 MW
 (d) steam generation capacity less than 8.5 MT

List - II

(Stack height (m))

- (i) $H = 14 (Q)^{0.3}$
 (ii) 275
 (iii) 220
 (iv) 9

Note : H = Physical stack height in metres

Q = Emission rate of SO₂ in kg/hr.

Codes :

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

33. The Water (Prevention and Control of Pollution) Act 1974

- (A) Regulates the discharge of hazardous pollutants into the nations surface water.
 (B) Regulates the emission of hazardous air pollutants.
 (C) Regulates waste disposal of sea.
 (D) Regulates the transportation of hazardous materials.

34. The harmonic mean of the numbers 0, 2, 4, 6 is :

- (A) 3 (B) 0 (C) 2 (D) 1

35. Assertion (A) : Wetlands are often described as ecotones.

Reason (R) : Wetlands are biologically rich dynamic zones of transition between two different ecosystems.

- (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

36. The first National Park established in India is :

- (A) Indira Gandhi National Park (B) Indravati National Park
 (C) Corbett National Park (D) Kaziranga National Park

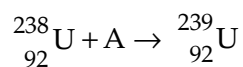
37. The main pollutant in vehicle emission is :

- (A) CO (B) CO₂ (C) SO₂ (D) SO₃

38. A device fitted to the exhaust system of a petrol driven motor vehicle to reduce emissions of pollutants is called as :

- (A) Conversion System (B) Conversion Kit
 (C) Catalytic Converter (D) Catalytic Box

39. The particle A in the following equation is :



- (A) p (B) e (C) n (D) α

40. The average solar constant is :
 (A) 1.2 cal/cm²/sec (B) 3.5 cal/cm²/sec
 (C) 1.2 k cal/cm²/sec (D) 2 cal/cm²/sec
41. Which one of the following group of plants is most resistant to ionising radiations ?
 (A) Coniferous Forest (B) Grass Land
 (C) Lichen and Mosses (D) Mixed Forest
42. How many moles of oxygen are required to burn one mole of propane ?
 (A) 2 (B) 3 (C) 4 (D) 5
43. What percentage of India's population lives in Urban Centres.
 (A) 20 (B) 30 (C) 10 (D) 50
44. The recent asbestos controversy about the French ship going to Alang was primarily due to :
 (A) Violation of Indian Coastal Zone Laws.
 (B) Violation of Transnational Movement of Hazardous Waste.
 (C) Gujarat State Pollution Control Laws.
 (D) Indian Air Pollution Laws.
45. Due to the increasing energy use the ozone layer over the arctic is :
 (A) Increasing (B) Decreasing
 (C) Not shifting in size (D) Not affected at all
46. Ecological restoration of degraded sites are aimed to :
 (A) Restore all biophysical characteristics of pristine ecosystem.
 (B) Restore social desirable and economically feasible characteristics of original ecosystem.
 (C) Leave it alone and allow natural regeneration.
 (D) Prohibit all human activity in the area.
47. The first Environmental Law in India was enacted in :
 (A) 1947 (B) 1950 (C) 1972 (D) 1982
48. The permissible Arsenic levels in drinking water is :
 (A) 20 µg/l (B) 50 µg/l (C) 75 µg/l (D) 50 mg/l
49. The mean annual rainfall in India is :
 (A) 110 mm (B) 110 cm (C) 85 cm (D) 110 m
50. The median of a set of numbers 2, 5, 8, 10, 12, 16, 20, 23 :
 (A) 10 (B) 12 (C) 12.5 (D) 9

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Space For Rough Work