

Signature and Name of Invigilator

1. (Signature) _____

(Name) _____

2. (Signature) _____

(Name) _____

J-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 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.

1. The correct sequence of the decreasing order of abundance of the given elements in the Earth's crust is :
 - (A) iron, oxygen, silicon, aluminium
 - (B) oxygen, aluminium, silicon, iron
 - (C) silicon, oxygen, iron, aluminium
 - (D) oxygen, silicon, aluminium, iron

2. Consider the following statement about the Himalayan orogeny :
 - (i) The orogeny resulted from the southward movement of the Indian plate
 - (ii) The orogeny began about 25 million years ago
 - (iii) The orogeny closed about 1 million year ago
 - (iv) The Himalaya have a root of relatively light crustal rock projecting in the denser mantleOf the statements :
 - (A) (i) and (ii) are correct
 - (B) (iii) and (iv) are correct
 - (C) (i) and (iii) are correct
 - (D) (ii) and (iv) are correct

3. Which one of the following statement is true of braided stream ?
 - (A) Width of channel is less than its depth
 - (B) Width and depth of a channel are equal
 - (C) Width of channel is greater than the depth
 - (D) Width and depth of a channel are unrelated

4. Consider the following plagic deposits :
 - (i) Diatom ooze
 - (ii) Globigerina ooze
 - (iii) Pteropod ooze
 - (iv) Radiolarian oozeThe correct sequence of occurrence of these pelagic deposits with increasing depth of the ocean is :
 - (A) (iii), (ii), (iv), (i)
 - (B) (ii), (iii), (i), (iv)
 - (C) (iii), (ii), (i), (iv)
 - (D) (ii), (iii), (iv), (i)

5. Which one of the following pairs of metals is commonly associated with copper ores ?
 (A) Gold and molybdenum (B) Tin and lead
 (C) Manganese and chromium (D) Platinum and nickel
6. In a vertical section across a sulphide deposit, the site representing the best situation for supergene enrichment would be :
 (A) above the water table (B) below the water table
 (C) in the oxidation zone (D) in the zone rich in humus
7. Who coined the term "Chronobiology" ?
 (A) Franz Halberg (B) M.K. Chandrasekhar
 (C) D.S. Farner (D) E. Bübbing
8. Acid rain is due to :
 (A) production of SO₂ gas
 (B) SO₂ gas converted to H₂SO₄
 (C) production of CO₂
 (D) Hydrocarbon containing varying amount of hydrogen and carbon
9. If nocturnal animal in the light dark cycle of 12 h light and 12 h darkness kept in constant darkness for 10 days, then what will happen to the on set of its daily activities :
 (A) start earlier than what was before
 (B) start later than what was before
 (C) no change in the activity time
 (D) activities remain on throughout the dark period
10. Whenever there is high BOD, DO is less so much that fish cannot survive, because :
 (A) Fish utilize all oxygen (B) Bacteria utilize all oxygen
 (C) Algae utilize all oxygen (D) Biological compounds are toxic to fish
11. The drinking water contaminated with E.Coli is not safe even after ordinary filtration, but if subjected to RO treatment it is much safe, because :
 (A) RO treatment kills bacteria
 (B) RO treatment generates O₃ that kills bacteria
 (C) There is a filtration at molecular level in RO system
 (D) RO treatment generate chlorine gas that kills bacteria
12. In a water body, there was food chain starting from planton to eagle. 0.3 PPT DDT was the concentration in the water, but in eagle's body it was found to be 25 PPM, This :
 (A) phenomenon is called as bioabsorption
 (B) phenomenon is called as biodesorption
 (C) phenomenon is called as biomagnification
 (D) phenomenon is called as biotransformation

13. For the vehicles using petrol one must carry valid PUC. To get such certificate one must have following parameters, in exhaust, below limits as prescribed by the authorities :
- (A) O₂, O₃ and SPM
 - (B) CO, HC
 - (C) CO and CO₂
 - (D) CO, CO₂ and the temperature of the exhaust
14. You are estimating a 'X' compound by colorimetry. Final, stable colour is pink. Which filter you will use to record your reading ? Filter having maximum transmission at :
- (A) 420 nm
 - (B) 540 nm
 - (C) 660 nm
 - (D) 700 nm
15. Carbon monoxide is poisonous to human because :
- (A) It causes mutations
 - (B) It is very soluble in blood
 - (C) It is combustible gas
 - (D) It strongly binds to heme
16. Separation of compounds in Gas Chromatography (GC) depend upon :
- (A) Molecular weight
 - (B) Solubility in carrier gas
 - (C) Solubility in stationary phase
 - (D) Solubility in carrier gas and liquid phase
17. To understand the 3D structure of the molecule following technique is used :
- (A) X ray diffraction
 - (B) Atomic absorption spectrophotometry
 - (C) MPTLC
 - (D) GC - MS/MS
18. Which element cannot be estimated by flame photometry ?
- (A) Na⁺
 - (B) K
 - (C) Li
 - (D) Fe
19. Electrophoresis cannot resolve molecules like :
- (A) Proteins
 - (B) Nucleic Acids
 - (C) DNA fragments
 - (D) Simple lipids
20. Which of the following instrument is most suitable to estimate heavy metals from the effluent ?
- (A) Chromatography
 - (B) Atomic Absorption spectrophotometer
 - (C) Flame photometer
 - (D) Electrophoresis
21. Which compound initiates the curling of root hairs in legumes ?
- (A) IAA
 - (B) Gibberellin
 - (C) Ethylene oxide
 - (D) Auxin

22. Which one of the following is the microsymbiont in Azolla - Anabaena symbiosis ?
 (A) Azolla (B) Anabaena
 (C) None of the above (D) Both (A) and (B)
23. Which of the following bacterium produces Bt toxin ?
 (A) Bacillus subtilis (B) Bacillus thuringensis
 (C) Bacillus stereothermophilus (D) Bacillus thermoruber
24. The scientist who got the first patent for genetically modified bacterium used for biodegradation of oil :
 (A) Wickerham (B) Chakraborty (C) Khurana (D) Beijernick
25. Leguminous plants are recommended for rotation of crops, because they :
 (A) kill insects (B) require little amount of water
 (C) help in nitrogen fixation (D) are cash crops
26. The compounds responsible for the proliferation of algal blooms in water bodies are :
 (A) Nitrates and chlorides (B) Nitrates and phosphates
 (C) Phosphates and silicates (D) Nitrates and carbonates
27. Which of the chlorine compound is used for the disinfection of municipal supply water ?
 (A) Hypochlorite (B) Calcium chloride
 (C) Potassium permanganate (D) Magnesium chloride
28. The colour of golden rice is due to the presence of :
 (A) Vitamin (B) Carotenoid (C) Flavonoid (D) Dye
29. The fungi most commonly involved in ectomycorrhizal association are :
 (A) Basidiomycetes (B) Ascomycetes
 (C) Phycomycetes (D) Deuteromycetes
30. The pink colouration of the root nodules of leguminous plants is due to :
 (A) Hemoglobin (B) Leghemoglobin (C) Nitrosoamine (D) Bilirubin
31. Upto 100 km, the scale length of the variation in pressure with altitude is :
 (A) ~ 12 km (B) ~ 1.8 km (C) ~ 7 km (D) ~ 3.2 km
32. The third moment of the data set 1, 2, 0, 3, 4 is :
 (A) 20 (B) 10 (C) 5 (D) 4
33. If the coefficient of correlation is r , then the coefficient of determination is :
 (A) \sqrt{r} (B) r^2 (C) r (D) $\frac{1}{r^2}$

34. For a Binomial distribution if p is the probability of happening of an event and $q = 1 - p$, then the variance in a sample of N observations would be :
- (A) Npq (B) \sqrt{Npq} (C) \sqrt{N}/pq (D) $pq / \sqrt{N-1}$
35. In fusion reaction involving Deuterium atoms $D + D = He^3 + n + X$, the energy released X is :
- (A) ~ 17.6 MeV (B) ~ 3.2 MeV (C) ~ 1 MeV (D) ~ 4 MeV
36. Which of the following noise indices is used in ascertaining the quality of noise environment according to WHO standards ?
- (A) L_{50} (B) L_{10}
 (C) L_{eq} for 8 hours (D) Instantaneous sound pressure level
37. The contribution of CO_2 in climate change is estimated to be about :
- (A) $\sim 57\%$ (B) $\sim 85\%$ (C) $\sim 90\%$ (D) $\sim 80\%$
38. Cost - Benefit Analysis seeks to analyse cost and benefits of a project in terms of :
- (A) Monetary gains
 (B) Social gain/loss
 (C) Environmental and monetary gains/losses
 (D) Social and Environmental costs and gains
39. The size distribution of suspended particulate matter in urban environment tends to follow which of the following distributions :
- (A) Binomial (B) Poisson (C) Normal (D) Log normal
40. An increase of 1 ppm in atmospheric concentration of CO_2 corresponds to an increase of carbon in atmosphere equivalent to an amount :
- (A) $\sim 5.1 \times 10^6$ Tons (B) $\sim 12.5 \times 10^6$ Tons
 (C) $\sim 1.4 \times 10^9$ Tons (D) ~ 2.12 Gigatons
41. Precautionary principle is a guiding rule in :
- (A) Cost benefit analysis (B) Cost effective analysis
 (C) Environmental impact analysis (D) Environmental Audit
42. A company or organization can go to ISO 14000 certification provided it has an ongoing Environmental Management System in operation for atleast :
- (A) 3 months (B) 6 months (C) 1 year (D) 5 years

43. The National ambient air quality standard for Respirable Suspended Particulate Matter (RSPM) in residential area recommends annual average concentrations in ($\mu\text{g}/\text{m}^3$) not exceeding :
- (A) $100 \mu\text{g}/\text{m}^3$ (B) $200 \mu\text{g}/\text{m}^3$ (C) $400 \mu\text{g}/\text{m}^3$ (D) $500 \mu\text{g}/\text{m}^3$
44. For dumping of radio active nuclear waste which of the following is the recommended site :
- (A) Saltmines (B) Oceans (C) Deserts (D) River beds
45. Which of the following coal types has the highest calorific value ?
- (A) Peat (B) Lignite (C) Anthracite (D) Bituminous
46. Which is the largest ecosystem in the world ?
- (A) Forests (B) Deserts (C) Oceans (D) Rivers
47. Which is the most abundant element in hot water springs ?
- (A) nitrogen (B) sulphur (C) carbon (D) phosphorous
48. **Assertion (A)** : Tropospheric ozone exists in urban areas.
Reason (R) : The photochemical reactions involving oxides of nitrogen produces O_3 .
- (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
49. A protein can be formed from any sequence of amino acids. How many different sequences can be obtained from a protein composed of 100 amino acids ?
- (A) 100 (B) 100^{20} (C) 100^{40} (D) 20^{100}
50. The last Earth Summit was held in which city ?
- (A) Rio de Janeiro (B) Kyoto
(C) Hague (D) Johannesburg

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Space For Rough Work