

Signature and Name of Invigilator

1. (Signature) _____

(Name) _____

2. (Signature) _____

(Name) _____

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)

J 8 9 1 5

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 Test Booklet Number should be entered on the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
- 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.
- 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.
- Read instructions given inside carefully.
- Rough Work is to be done in the end of this booklet.
- 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.
- 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.
- Use only Blue/Black Ball point pen.
- Use of any calculator or log table etc., is prohibited.
- There are no negative marks for incorrect answers.

परीक्षार्थियों के लिए निर्देश

- इस 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 पुस्तिका 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 आपकी अतिरिक्त समय दिया जायेगा।
 - 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।
- 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।
- 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 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 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।
- 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 डुप्लीकेट प्रति अपने साथ ले जा सकते हैं।
- 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 उत्तरों के लिए कोई नकारात्मक अंक नहीं हैं।



ENVIRONMENTAL SCIENCE
PAPER - II

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

1. An endotherm's basal metabolic rate stays constant throughout a range of environmental temperatures known as the :
(I) Lower critical temperature zone
(II) Thermoneutral zone
(III) Higher critical temperature zone
Choose the **correct** answer :
(1) (I) only (2) (II) only (3) (I) and (II) only (4) (II) and (III) only

2. Which state has the largest coastline in India ?
(1) West Bengal (2) Karnataka (3) Gujarat (4) Odisha

3. Indicators for sustainable development are :
(I) environmental pressures
(II) environmental quality
(III) society's response
Choose the **correct** answer :
(1) (I) and (II) only (2) (II) and (III) only (3) (I) and (III) only (4) (I), (II) and (III)

4. Stoichiometric calculations are based on :
(1) Moles (2) Atomic weight (3) Atomic number (4) Loss of mass

5. BOD of the effluents discharged on land for irrigation should not exceed :
(1) 30 mg/L (2) 100 mg/L (3) 300 mg/L (4) 60 mg/L

6. Which of the following adds to the carbon dioxide concentration in atmosphere ?
(I) Volcanic action (II) Respiration
(III) Photosynthesis (IV) Decay of organic matter
Choose the **correct** answer :
(1) (I) and (III) only (2) (II) only
(3) (I), (II) and (IV) only (4) (I), (II), (III) and (IV)

7. Corrosion normally occurs when an electrochemical cell is set up on a metal surface. The corroded area is :
(1) cathode (2) anode
(3) electrolyte (4) entire metal surface



8. Acid sulphate soils are characteristic of marine coastal plains in areas rich in :
 (I) Organic matter
 (II) Brackish water
 (III) Mangrove swamps
 Choose the **correct** answer :
 (1) (I) only (2) (I) and (II) only
 (3) (II) only (4) (I), (II) and (III)
9. The amount of energy at one trophic level divided by the amount of energy at the trophic level immediately below it is termed as :
 (1) Trophic efficiency (2) Consumption efficiency
 (3) Assimilation efficiency (4) Production efficiency
10. Blue whale is placed under the category of :
 (1) Endangered species (2) Critically endangered species
 (3) Vulnerable species (4) Extinct species
11. Maximum density of detritivorous micro organisms in pond ecosystem are present in :
 (1) Limnetic zone (2) Photic zone (3) Littoral zone (4) Benthic zone
12. Species diversity show a marked pattern as one moves from equator to the poles. Species diversity :
 (1) increases as one moves towards the poles from the equator
 (2) decreases as one moves from equator to poles
 (3) remains constant as one moves from equator to poles
 (4) is highest in the arctic and antartic regions
13. Coral reefs are mainly distributed globally in :
 (1) Temperate waters (2) Tropical waters
 (3) Antarctic waters (4) Arctic waters
14. Most common soil borne bacterial pathogen that manipulates plant by injecting its DNA segment into plant cell is :
 (1) *Acidaminococcus fermentans* (2) *Clostridium thermoacetium*
 (3) *Rhizobium leguminosarum* (4) *Agrobacterium tumefaciens*
15. Which among the following are the best tools/techniques to study landscape fragmentation ?
 (I) Remote sensing (II) Geodesy
 (III) Cartography (IV) Geographical Information System
 Choose the **correct** answer :
 (1) (I) and (II) only (2) (I), (III) and (IV) only
 (3) (II), (III) and (IV) only (4) (I), (II), (III) and (IV)



16. An earthquake's epicentre is :
- (1) usually in the lower part of the mantle
 - (2) determined by analysing S - wave arrival time at seismic stations
 - (3) determined by analysing P - wave arrival time at seismic station
 - (4) a point on the surface directly above the focus
17. Water entrapped at the time of formation of the sedimentary rocks is called :
- (1) Meteoric water
 - (2) Connate water
 - (3) Juvenile water
 - (4) Groundwater
18. Which of the following pairs of igneous rocks have the same mineral composition ?
- (1) Granite - basalt
 - (2) Andesite - rhyolite
 - (3) Basalt - gabbro
 - (4) Pumic - basalt
19. Traps for petroleum and natural gas formed by deformation such as folding and fracturing of rocks are known as :
- (1) Lithification traps
 - (2) Reservoir traps
 - (3) Structural traps
 - (4) Stratigraphic traps
20. In which one of the following areas does radiant drainage fully develop ?
- (1) On a point bar
 - (2) Around an ox-bow lake
 - (3) Near a delta
 - (4) Around a volcano
21. Which of the following countries produce highest amount of hydropower ?
- (1) Australia
 - (2) Canada
 - (3) Italy
 - (4) India
22. A solar cell of area $10\text{ cm} \times 10\text{ cm}$ produces a voltage of 0.6 V and a current upto 2 A. If solar insolation is 1000 Wm^{-2} , the efficiency of the solar cell is :
- (1) 15%
 - (2) 12%
 - (3) 25%
 - (4) 24%
23. An ocean wave has a height of 3 m and has time period of 10 sec. The power available for extraction from this wave in the units of kW per meter of the wavefront is approximately :
- (1) 30
 - (2) 45
 - (3) 90
 - (4) 300
24. In the case of Silicon solar cell ($E_g = 1.12\text{ eV}$), the maximum wavelength of solar radiations for production of electron-hole pairs is :
- (1) $\sim 560\text{ nm}$
 - (2) $\sim 480\text{ nm}$
 - (3) $\sim 720\text{ nm}$
 - (4) $\sim 1100\text{ nm}$
25. The share of India in the total annual GHG emissions of the world is approximately :
- (1) 5 - 7%
 - (2) 10 - 12%
 - (3) 17 - 20%
 - (4) 20 - 25%
26. In biogas, the percentage (%) of methane is in the range of :
- (1) 50 - 70%
 - (2) 30 - 40%
 - (3) 70 - 90%
 - (4) 40 - 50%



27. Indira Gandhi canal passes through the following state :
 (I) Punjab (II) Haryana (III) Uttar Pradesh (IV) Rajasthan
 Choose the **correct** answer :
 (1) (I), (II) only (2) (I), (II), (III) only
 (3) (I), (II), (IV) only (4) (I), (II), (III), (IV)
28. Trichloromonofluoromethane is :
 (I) Freon - II
 (II) A spray can propellant
 (III) A chlorofluorocarbon
 Choose the **correct** answer :
 (1) (I) only (2) (II) and (III) only (3) (I) and (III) only (4) (I), (II) and (III)
29. Which of the following air pollutants are released by thermal power plants ?
 (I) Oxides of nitrogen (II) Oxides of sulphur
 (III) Ammonia (IV) Carbon monoxide
 Choose the **correct** answer :
 (1) (I), (III) and (IV) only (2) (II) and (III) only
 (3) (I), (II) and (IV) only (4) (I), (II), (III) and (IV)
30. The Noise Index L_{eq} for a specific duration is a measure of :
 (1) acoustic energy content
 (2) average noise amplitude
 (3) sum of instantaneous sound pressure levels
 (4) fluctuations in noise levels
31. When DDT enters the human body, it is :
 (1) water soluble and easily excreted in urine
 (2) stored in the bones
 (3) fat soluble and stored in fat tissues
 (4) processed by enzymes and becomes a different compound which is toxic
32. In which EIA guidelines notification, developmental projects were categorized as 'A' and 'B' in India ?
 (1) EIA guidelines notification, 1994 (2) EIA guidelines notification, 1986
 (3) EIA guidelines notification, 2006 (4) EIA guidelines notification, 2000
33. Three important rivers of Indian sub-continent have their source near the Mansarovar lake in Tibet. These rivers are :
 (1) Indus, Jhelum, Ganga (2) Indus, Sutlej, Yamuna
 (3) Indus, Sutlej, Brahmaputra (4) Yamuna, Brahmaputra, Gandak



34. Which state in India has the highest area of wastelands under barren/stony/rock category ?
 (1) Jammu and Kashmir (2) Himachal Pradesh
 (3) Arunachal Pradesh (4) Uttarakhand
35. During clearance of any developmental project, the minimum distance required for site selection from eco-sensitive zone is :
 (1) 5 km (2) 10 km (3) 15 km (4) 20 km
36. Which of the following are true regarding 'Jhum' cultivation in India ?
 (I) It is largely practiced in N-E India
 (II) Fertility is exhausted in a few years
 (III) It is referred as 'Slash and Burn' technique
 Choose the **correct** answer :
 (1) (I), (II) and (III) (2) (I) and (II) only
 (3) (II) and (III) only (4) (I) and (III) only
37. Compensatory afforestation provisions are covered under the Environment Act names as :
 (1) Indian Forest Act (Revised), 1982 (2) Environment Protection Act, 1986
 (3) Forest Conservation Act, 1980 (4) Public Liability Insurance Act, 1981
38. When a disaster has occurred, the early action in a Disaster Management Plan could be :
 (1) Response and Rescue (2) Warning and preparedness
 (3) Relief and Rehabilitation (4) Shelter and Food supply
39. An environmental problem associated with landfill waste disposal site is :
 (I) Methane production
 (II) Ground water pollution
 (III) Incomplete decomposition
 Choose the **correct** answer :
 (1) (I) and (II) only (2) (I), (II) and (III)
 (3) (I) and (III) only (4) (II) and (III) only
40. Eco-labelling of commercial products is regulated by :
 (1) ISO 14020 (2) ISO 14010 (3) ISO 14030 (4) ISO 14040
41. Which one of the following is not a part of 'Waste Reduction' strategy ?
 (1) Reduced use of raw material (2) Material Reuse
 (3) Recycling of waste (4) Decreased toxicity
42. The expanded form of ISWM is :
 (1) International Standards of Waste Management
 (2) Indian Standards for Waste Material
 (3) Integrated Solid Waste Management
 (4) International Solid Waste Management



43. Municipal Solid Waste (Handling and Management) rule and Biomedical Waste (Handling and Management) rule were implemented in the years respectively :
 (1) 2000 and 1998 (2) 1998 and 2002 (3) 1996 and 1998 (4) 1990 and 1985
44. If a phosphorous limited lake having surface area equal to $80 \times 10^6 \text{ m}^2$ is fed by stream with flow rate $20 \text{ m}^3/\text{s}$ that has phosphorous concentration of 0.01 mg/L , then the phosphorous loading from the incoming stream is :
 (1) 4.0 g/s (2) 0.2 g/s (3) 0.4 g/s (4) 0.6 g/s
45. If K is the carrying capacity of a population N in an ecosystem following the logistic growth, its growth rate becomes zero when :
 (1) $N/K=0$ (2) Mortality > Natality
 (3) $N/K=1$ (4) $N = \text{Half of the carrying capacity of the habitat}$
46. A good sample design should result in :
 (1) A truly representative sample (2) Highly varied sampling error
 (3) Low level of confidence (4) Unsystemic bias
47. The mean of a Poisson's distribution is 8. Its standard deviation is :
 (1) 2 (2) $2\sqrt{2}$ (3) 4 (4) $\frac{8}{5}$
48. Destructive powers of Tsunami result mainly from its :
 (1) Incredible Height
 (2) Unpredictability
 (3) Momentum and long wavelength
 (4) Cold water
49. Which one of the following is **not** correct for drip irrigation ?
 (1) Drip consists of a network of perforated plastic tubing below the ground surface
 (2) Drip irrigation increases fertilizer use and water pollution from fertilizer run-off
 (3) Small holes in the tubing drops off water at a slow rate close to plant roots
 (4) This technique was developed in Israel in the 1960's
50. The non-formal Environmental Education in India provides support to :
 (I) Eco-clubs
 (II) GLOBE
 (III) Environmental appreciation courses
 Choose the **correct** answer :
 (1) (I) and (II) only (2) (II) and (III) only
 (3) (I) and (III) only (4) (I), (II) and (III)

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Space For Rough Work

