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PAPER-II ENVIRONMENTAL SCIENCES

Signature and Name of Invigilator

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(Name) _____

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J 8 9 1 3

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)

Time : 1 ¼ hours]

[Maximum Marks : 100

Number of Pages in this Booklet : 8

Number of Questions in this Booklet : 50

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. 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 :
 - (i) To have access to the Question Booklet, tear off the paper seal / polythene bag on the booklet. Do not accept a booklet without sticker-seal / without polythene bag and do not accept an open booklet.
 - (ii) **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.**
 - (iii) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
Example : (A) (B) (C) (D)
where (C) is the correct response.
5. Your responses to the items are to be indicated in the **OMR Sheet given inside the Paper I Booklet only**. If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. 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, you will render yourself liable to disqualification.
9. 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 duplicate copy of OMR Sheet on conclusion of examination.
10. Use only **Blue/Black Ball point pen**.
11. Use of any calculator or log table etc., is prohibited.
12. There is no negative marks for incorrect answers.

परीक्षार्थियों के लिए निर्देश

1. पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए ।
2. इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं ।
3. 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 :
 - (i) प्रश्न-पुस्तिका खोलने के लिए पुस्तिका पर लगी कागज की सील / पोलिथीन बैग को फाड़ लें । खुली हुई या बिना स्टीकर-सील / बिना पोलिथीन बैग की पुस्तिका स्वीकार न करें ।
 - (ii) **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 ।**
 - (iii) इस जाँच के बाद OMR पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें ।
4. प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (A), (B), (C) तथा (D) दिये गये हैं । आपको सही उत्तर के वृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है ।
उदाहरण : (A) (B) (C) (D) जबकि (C) सही उत्तर है ।
5. प्रश्नों के उत्तर केवल प्रश्न पत्र I 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 चिह्नांकित करते हैं, तो उसका मूल्यांकन नहीं होगा ।
6. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें ।
7. कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें ।
8. 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, तो परीक्षा के लिये अयोग्य घोषित किये जा सकते हैं ।
9. 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 । हालांकि आप परीक्षा समाप्ति पर OMR पत्रक की डुप्लीकेट प्रति अपने साथ ले जा सकते हैं ।
10. केवल नीले/काले बाल प्वाइंट पेन का ही इस्तेमाल करें ।
11. किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है ।
12. गलत उत्तरों के लिए कोई अंक काटे नहीं जाएँगे ।

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P.T.O.

ENVIRONMENTAL SCIENCES

Paper – II

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

1. **Assertion (A) :** Every country should integrate the principles of sustainable development into its policies and programmes.
- Reason (R) :** Environmental resources are a Nation's wealth.
- Choose the correct code from the following :
- (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.
2. Wind rose represents statistical distribution of
- (A) Wind velocity in vector form
- (B) Wind speeds in scalar form
- (C) Wind speeds in π diagram
- (D) Wind speeds in the form of histograms
3. In the redox reaction given below, which one of the substrates in forward reaction is oxidized ?
- $$2\text{Fe}^{3+} + \text{H}_2 \rightarrow 2\text{Fe}^{2+} + 2\text{H}^+$$
- (A) Fe^{3+}
- (B) H_2
- (C) H^+
- (D) Fe^{2+}
4. If soil in a given area is wetted and allowed to drain till percolation is stopped, the amount of water thus retained is called
- (A) Storage capacity
- (B) Capillary capacity
- (C) Hygroscopic capacity
- (D) Field capacity
5. Quantity of 5M HCl required for preparing 1000 ml of 0.1 M HCl is,
- (A) 20 ml
- (B) 2 ml
- (C) 200 ml
- (D) 100 ml
6. The method which can be used for the softening of water having high calcium, high magnesium-carbonate hardness and some noncarbonate hardness
- (A) single-stage line process.
- (B) excess lime process.
- (C) single stage lime-soda ash process.
- (D) excess lime-soda ash process.
7. Spotted deer, Asiatic wild ass, Black buck are,
- (A) Endangered species
- (B) Vulnerable species
- (C) Threatened species
- (D) Key species

8. Specific mortality of members of a population is expressed by
 (A) Life table
 (B) Survivorship curve
 (C) Rate of mortality
 (D) Rate of fecundity
9. Which group of vertebrate comprises maximum number of endangered species ?
 (A) Fish
 (B) Amphibia
 (C) Reptiles
 (D) Birds
10. Under anaerobic condition denitrifying Pseudomonas changes,
 (A) Nitrate to molecular nitrogen
 (B) Nitrate to ammonia
 (C) Nitrate to Nitrite
 (D) Nitrite to Nitrate
11. The Phenomenon of having higher number of species in ecotone is called
 (A) Dominance effect
 (B) Edge effect
 (C) Abundance
 (D) Frequency
12. Which specific common feature is not found in zooplankton and rabbit ?
 (A) Both are animals
 (B) Both are primary consumers
 (C) Both are carnivores
 (D) Both are herbivores
13. The following exogenous and endogenous factors are the cause of extinction of animal species :
 I. Ecological niche
 II. Decrease in reproductive potency.
 III. Lesser adaptability to fluctuating environment.
 Choose the correct answer from the codes given below :
Codes :
 (A) I only
 (B) II only
 (C) I and II
 (D) I, II and III
14. Positive mass balance of glaciers has been recently reported from
 (A) Eastern Himalayas
 (B) Nepal Himalayas
 (C) Western Himalayas
 (D) Karakoram
15. Which of the following will lead to reduction in greenhouse gases in atmosphere ?
 (A) Increased chemical weathering of rocks.
 (B) Volcanic eruption
 (C) Lowering of mean sea level
 (D) An increase in melting of glacial ice
16. The unconsolidated material with highest permeability is
 (A) Landslide with clayey component
 (B) Altered volcanic ash
 (C) Well sorted alluvial sand
 (D) Buried mud flows

17. Which of the following component of cryosphere has the longest life ?
 (A) Sea ice
 (B) Icebergs
 (C) Valley glaciers
 (D) Ice sheets
18. Aerobic bacteria is most active in
 (A) Moist and saturated soil
 (B) Moist and non-saturated soil
 (C) Alluvial soil
 (D) Permafrost
19. Andisols are formed by
 (A) Biological activity
 (B) Erosion by wind
 (C) Erosion by waves
 (D) Volcanoes
20. In case of photovoltaic cell, the maximum theoretical efficiency of conversion is
 (A) ~ 45 % (B) ~ 30 %
 (C) ~ 25 % (D) ~ 50 %
21. Consider an ideal wind power generator of the wind speed increases 3 times, the power output would increase by how many times ?
 (A) 3 (B) 9
 (C) 27 (D) 81
22. Identify the correct sequence in increasing order of total CO₂ emissions from various countries at present.
 (A) Britain < India < China < USA
 (B) India < Britain < China < USA
 (C) Britain < USA < India < China
 (D) Britain < India < USA < China
23. Arsenic compounds cause
 (A) Dwarfism
 (B) Dermatitis
 (C) Thyrotoxicosis
 (D) Wilson's disease
24. What is the pE value in an acid mine water sample having
 $[Fe^{2+}] = 7.03 \times 10^{-3} M$ and
 $[Fe^{3+}] = 3.71 \times 10^{-4} M$
 (A) 10.5 (B) 12.5
 (C) 14.5 (D) 18.5
25. **Assertion (A) :** Chronic exposure to ozone is a possible contributor to forest decline.
Reason (R) : Surface ozone is a green house gas.
 Identify the correct code :
 (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.
26. Identify the most dominant pollutant in terms of its concentration levels in urban atmosphere.
 (A) Oxides of nitrogen
 (B) Oxides of sulphur
 (C) Particulate matter
 (D) Carbon monoxide
27. The main constituents of photochemical smog are
 (A) Oxides of sulphur and CO
 (B) Oxides of sulphur and hydrocarbons
 (C) Oxides of nitrogen and CO
 (D) Oxides of nitrogen, hydrocarbons and ozone

28. The air borne fraction of carbon is
 (A) ~ 0.72 (B) ~ 0.62
 (C) ~ 0.46 (D) ~ 0.38
29. The noise index L_{eq} is used for noise standards in ambient environment of urban areas. The prescribed duration of the integration associated with L_{eq} is
 (A) 12 hours (B) 8 hours
 (C) 1 hour (D) 30 minutes
30. In alkaline soils, which of the following is not present in soluble state ?
 (A) Phosphorous (B) Calcium
 (C) Nitrates (D) Potassium
31. Which one of the following is not a post audit activity under environmental audit process ?
 (A) Review of draft report by Law department.
 (B) Issue of final report to functional specialist.
 (C) Develop action plan to establish responsibility.
 (D) Report audit findings.
32. Which one of the following pairs is correctly matched ?
 (A) Specification for environmental management system ISO 14001
 (B) Environmental performance evaluation ISO 14040
 (C) Guidelines for environmental auditing ISO 14000
 (D) Environmental labels and declaration ISO 14004
33. In accordance with the Indian EIA notification 2006, within how many days if Environmental Appraisal Committee do not specify the Terms of Reference, the proponent can go ahead with its own Terms of Reference.
 (A) 15 days
 (B) 45 days
 (C) 60 days
 (D) 90 days
34. Which is the correct sequence for impact assessment process in EIA ?
 (A) Description of Environment → Identification of impacts → Prediction of impacts → Evaluation of impacts → Identification of mitigation needs.
 (B) Identification of impacts → Prediction of impacts → Evaluation of impacts → Identification of mitigation needs.
 (C) Identification of impacts → Description of Environment → Prediction of impacts → Evaluation of impacts → Identification of mitigation needs.
 (D) Prediction of impacts → Identification of impacts → Description of environment → Evaluation of impacts → Identification of mitigation needs.

35. Quantifying the energy and raw material requirement as a part of life cycle assessment, is termed as
- (A) Life Cycle improvement analysis.
 (B) Life Cycle impact analysis.
 (C) Life Cycle inventory.
 (D) Life Cycle pre-requisites.
36. Which of the following pertains to “high-waste approach” in dealing with the solid and hazardous wastes ?
- (A) Burying and burning
 (B) Recycling
 (C) Composting
 (D) Reusing
37. **Assertion (A) :** Dumping of sewage to river water may decrease oxygen even below 4 mg/l.
Reason (R) : Dumping of sewage pollutes river water heavily.
 Identify the correct answer :
- (A) Both (A) and (R) are true with (R) being the correct explanation.
 (B) Both (A) and (R) are true, but (R) is not the correct explanation.
 (C) (A) is true, but (R) is wrong.
 (D) Both (A) and (R) are wrong.
38. In most of the studies, a large sample size is anticipated to
- (A) get a low level of precision.
 (B) maximize the sampling error.
 (C) get a high level of precision.
 (D) maximize the standard deviation.
39. The geometric mean of 4, 8 and 16 is
- (A) 9.3
 (B) 8.0
 (C) 4.8
 (D) 10.2
40. The covariance between two data of N observations each represented by variables X and Y is given by
- (A) $\frac{\sum (X - \bar{X})(Y - \bar{Y})}{N^2}$
 (B) $\frac{\sum (X - \bar{X})^2 (Y - \bar{Y})^2}{N}$
 (C) $\frac{\sum (X - \bar{X})^2 (Y - \bar{Y})^2}{N^2}$
 (D) $\frac{\sum (X - \bar{X})(Y - \bar{Y})}{N}$
41. The mean and standard deviation of a Binomial distribution are 9 and 1, respectively. The first moment of the distribution is
- (A) 9
 (B) 3
 (C) 1
 (D) 0
42. Which one of the following is used in manufacturing flexible plastic bags and sheets ?
- (A) Polystyrene (PS)
 (B) Polyethylene terephthalate (PET)
 (C) Low density polyethylene (LDPE)
 (D) TEFLON

43. Which one of the following is a non-formal environment education and awareness programme ?
- (A) Environmental appreciation courses.
 (B) National Environment Awareness Campaign.
 (C) Environmental Education in school system.
 (D) Environmental Management Business Studies.
44. Bioparks are conceived, developed and managed with a goal of conservation of biodiversity through,
- (i) development of educational and scientific activities.
 (ii) promoting silviculture and monoculture.
 (iii) promoting local community welfare without harming the natural habitat.
- Choose the correct answer from the codes :
- Codes :**
- (A) (i) and (ii)
 (B) (ii) and (iii)
 (C) (i) and (iii)
 (D) (i), (ii) and (iii)
45. In about a 7 metre deep pond the series of vegetation development will be
- (A) Submerged → Floating → Reed → Herb
 (B) Floating → Submerged → Reed → Herb
 (C) Floating → Reed → Submerged → Herb
 (D) Submerged → Reed → Floating → Herb
46. In terrestrial ecosystems, roughly how much NPP ends up being broken down by decomposers ?
- (A) 90 %
 (B) 70 %
 (C) 50 %
 (D) 10 %
47. Which of the following BOD level waste water is permitted to be released inlands by industries under water (Prevention and Control of Pollution) Act, 1974 ?
- (A) 30 mg/l
 (B) 80 mg/l
 (C) 100 mg/l
 (D) 150 mg/l
48. Hydraulic conductivity is a function of
- (A) medium alone
 (B) fluid alone
 (C) either fluid or medium
 (D) both fluid and medium
49. Dachigan sanctuary is associated with
- (A) Hangul
 (B) Rhinoceros
 (C) Barking deer
 (D) Leopard
50. Rio+20 summit was held in
- (A) Durban
 (B) Johannesburg
 (C) Rio de Janeiro
 (D) Cancun



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