

Test Booklet Code & Serial No.

प्रश्नपत्रिका कोड व क्रमांक

Paper-II

B

## ENVIRONMENTAL SCIENCE

Signature and Name of Invigilator

1. (Signature) .....

(Name) .....

2. (Signature) .....

(Name) .....

Seat No.

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(In figures as in Admit Card)

Seat No. ....

(In words)

OMR Sheet No.

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(To be filled by the Candidate)

JAN - 31218

Time Allowed : 1¼ Hours]

[Maximum Marks : 100

Number of Pages in this Booklet : 16

Number of Questions in this Booklet : 50

### Instructions for the Candidates

- Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
- This paper consists of 50 objective type questions. Each question will carry two marks. All questions of Paper-II will be compulsory, covering entire syllabus (including all electives, without options).
- At the commencement of examination, the question booklet will be given to the student. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as follows :
  - 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 or 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 missing pages/questions or questions repeated or not in serial order or any other discrepancy should not be accepted and correct booklet should be obtained from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given. The same may please be noted.**
  - After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
- Each question 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** : where (C) is the correct response.  

|                       |                       |                                  |                       |
|-----------------------|-----------------------|----------------------------------|-----------------------|
| <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| A                     | B                     | C                                | D                     |
- Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only**. If you mark 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 at the end of this booklet.
- If you write your Name, Seat 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.
- You have to return original OMR Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry the Test 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 is no negative marking for incorrect answers.**

### विद्यार्थ्यांसाठी महत्वाच्या सूचना

- परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठवरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
- सदर प्रश्नपत्रिकेत 50 बहुपर्यायी प्रश्न आहेत. प्रत्येक प्रश्नास दोन गुण आहेत. या प्रश्नपत्रिकेतील सर्व प्रश्न सोडविणे अनिवार्य आहे. सदरचे प्रश्न हे या विषयाच्या संपूर्ण अभ्यासक्रमावर आधारित आहेत.
- परीक्षा सुरु झाल्यावर विद्यार्थ्यांला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्यात.
  - प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्विकारू नये.
  - पहिल्या पृष्ठावर नमूद केल्याप्रमाणे प्रश्नपत्रिकेची एकूण पृष्ठे तसेच प्रश्नपत्रिकेतील एकूण प्रश्नांची संख्या पडताळून पहावी. पृष्ठे कमी असलेली/कमी प्रश्न असलेली/प्रश्नांचा चुकीचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनिटातच पर्यवेक्षकाला परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी. त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही तसेच वेळी वाढवून मिळणार नाही याची कृपया विद्यार्थ्यांनी नोंद घ्यावी.
  - वरीलप्रमाणे सर्व पडताळून पहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा नंबर लिहावा.
- प्रत्येक प्रश्नासाठी (A), (B), (C) आणि (D) अशी चार विकल्प उत्तरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळ/निळ्या करावा.  
**उदा.** : जर (C) हे योग्य उत्तर असेल तर.  

|                       |                       |                                  |                       |
|-----------------------|-----------------------|----------------------------------|-----------------------|
| <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| A                     | B                     | C                                | D                     |
- या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत. इतर ठिकाणी लिहिलेली उत्तरे तपासली जाणार नाहीत.
- आत दिलेल्या सूचना काळजीपूर्वक वाचाव्यात.
- प्रश्नपत्रिकेच्या शेवटी जोडलेल्या कोऱ्या पानावरच कच्चे काम करावे.
- जर आपण ओ.एम.आर. वर नमूद केलेल्या ठिकाणा व्यतिरिक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खुण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमागाचा अवलंब केल्यास विद्यार्थ्यांला परीक्षेस अपात्र ठरविण्यात येईल.
- परीक्षा संपल्यानंतर विद्यार्थ्यांने मूळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांकडे परत करणे आवश्यक आहे. तथापी, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्याबरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
- फक्त निळ्या किंवा काळ्या बॉल पेनचाच वापर करावा.**
- कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.**
- चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.**

**JAN - 31218/II—B**

## Environmental Science

### Paper II

**Time Allowed : 75 Minutes]**

**[Maximum Marks : 100**

**Note :** This Paper contains **Fifty (50)** multiple choice questions. Each question carries **Two (2)** marks. Attempt *All* questions.

- |  |  |
|--|--|
| <p>1. In economics service is provided by economic capital, then what will be in ecology ?</p> <p>(A) National capital</p> <p>(B) Exponential expansion</p> <p>(C) Disposal</p> <p>(D) Manufacturing</p> <p>2. Levels of organization is seen in an ecological spectrum :</p> <p>(A) Gene → Cell → Organs<br/>→ Organism → Population<br/>→ Communities</p> <p>(B) Cell → Gene → Organism<br/>→ Communities and Population</p> <p>(C) Organism → Organ → Cell<br/>→ Gene → Population<br/>→ Communities</p> <p>(D) Communities → Population<br/>→ Gene &amp; Cells</p> | <p>3. In a waste water treatment plant, the removal of settleable solid and floating matter is done in a :</p> <p>(A) Primary classifiers</p> <p>(B) Grit chamber</p> <p>(C) Bar screen</p> <p>(D) Equalization tank</p> <p>4. In an activated sludge method used for sewage treatment aeration is done by :</p> <p>(A) Natural aeration</p> <p>(B) Surface mechanical aeration</p> <p>(C) No aeration is required</p> <p>(D) Surface and diffuse aeration</p> |
|--|--|

5. Three basic processes are involved in the overall anaerobic digestion of sewage sludge following any of the sequence :
- (A) Hydrolysis → Fermentation  
→ Methanogenesis
- (B) Fermentation → Hydrolysis  
→ Methanogenesis
- (C) Hydrolysis → Methanogenesis  
→ Fermentation
- (D) Methanogenesis → Fermentation  
→ Hydrolysis
6. In a nitrogen cycle denitrification is :
- (A) Organic matter → Ammonia
- (B) Ammonia → Nitrites
- (C) Nitrites → Nitrates
- (D) Nitrates → Nitrogen
7. A regression line passing through zero will have intercept value of :
- (A) + 1
- (B) + .05
- (C) Zero
- (D) - 1
8. A combination of numbers has geometric mean as 6.0 and arithmetic mean as 6.3. These numbers are :
- (A) 6, 6, 6
- (B) 5, 6, 8
- (C) 4, 6, 9
- (D) None of the above

9. Tropical storms (cyclones) over the Bay of Bengal & the Arabian Sea have a bimodal frequency having peaks during :
- (A) Jan.-Feb. & March-May  
 (B) Dec.-Jan & March-April  
 (C) March-May & Oct.-Nov  
 (D) July-August & April-May
10. On the west coast the rainfall is heavy during south west monsoon due to :
- (A) Decreases as we move westwards  
 (B) Increases over the Ghats & then decreases westwards  
 (C) Increases westwards uniformly  
 (D) Decreases over the Ghats & then increases westwards
11. Severe thunderstorm known as Norwesters are common in..... during pre monsoon season.
- (A) Uttar Pradesh  
 (B) Rajasthan  
 (C) Assam & Bengal  
 (D) Konkan & Goa
12. Which one of the following is a strong electrophile ?
- (A) NO  
 (B) NO<sup>+</sup>  
 (C) NO<sub>2</sub>  
 (D) NO<sub>2</sub><sup>+</sup>

13. The Diluvial theory identified which of the following factors as responsible for the shaping of today's earth surface :
- (A) Plate Tectonics
  - (B) Glaciers
  - (C) The nature of the Earth's orbit around the sun
  - (D) Floods
14. In oceanic oxygen isotope data, more oxygen 18 indicates which of the following conditions ?
- (A) Warm temperatures
  - (B) Cold temperatures
  - (C) Snow enriched in oxygen 18
  - (D) Windy conditions
15. Activity of methanogens in biomethanation digester is totally inhibited due to :
- (A) More oxygen (8 ppm)
  - (B) Neutral pH (6.8-7.2) of feedstock slurry
  - (C) Presence of syntrophic microbes
  - (D) Absence of oxygen
16. In order to use Tree rings to reconstruct past environmental conditions, which of the following scales must be developed ?
- (A) Delta PDB
  - (B) Delta SMOW
  - (C) GISP Core
  - (D) Calibration Interval

17. Which of the following may be responsible for a widening of recent tree rings ?

- (A) Aging of trees
- (B) Increasing dry conditions
- (C) Later, cooler springs
- (D) Increased atmospheric CO<sub>2</sub>

18. The period during which the sun lacked sun spots is referred to as the :

- (A) Milankovitch Mechanism
- (B) Maunder Minimum
- (C) Year without a summer
- (D) Last ICE AGE

19. Passive solar heating technique can be used in building design in mid by latitude having :

- (A) Large windows facing South
- (B) Large windows facing North
- (C) Small windows facing South
- (D) Windows facing East or West

20. Arrange the following Greenhouse gases in the increasing order of their contribution to global warming :

- (A) CH<sub>4</sub>, CO<sub>2</sub>, NO<sub>X</sub>
- (B) CH<sub>4</sub>, NO<sub>X</sub>, CO<sub>2</sub>
- (C) NO<sub>X</sub>, CH<sub>4</sub>, CO<sub>2</sub>
- (D) CO<sub>2</sub>, CH<sub>4</sub>, NO<sub>X</sub>

21. Monsoon Depressions which are common during S-W Monsoon season :

- (A) Form over NE Bay of Bengal
- (B) Form over Arabian sea
- (C) Form over South-East Bay of Bengal
- (D) Form over North Maharashtra Gujrat coast

22. The elongated and streamlined ridges that look like an overturned ship's hull that are created by wind abrasion are called :

- (A) Yardangs
- (B) Pediments
- (C) Inselbergs
- (D) Buffes

23. The greatest recorded mass extinction to affect Earth occurred at the end of.....period.

- (A) Cretaceous
- (B) Tertiary
- (C) Peronian
- (D) Jurassic

24. A beveled surface that slopes gently seaward, formed by erosion and landward retreat of a sea cliff is termed as :

- (A) Plateau
- (B) Wave-cut platform
- (C) Wave base
- (D) Table land

25. The zone above water table that contains both water and air within the pore spaces of the rock sediment or soil is termed as :

- (A) zone of accumulation
- (B) zone of saturation
- (C) zone of aeration
- (D) zone of wastage

26. The on-site monitoring data is known as.....data.

- (A) secondary
- (B) primary
- (C) tertiary
- (D) numerical

27. Which of the biota will suffer in the anoxic situation of the lake ?

- (A) Floating
- (B) Surface
- (C) Benthic
- (D) Peripheral

28. Socio-economic Impact Assessment of proposed project can be best interpreted by :

- (A) Absolute threshold value (ATV)
- (B) Rational threshold value (RTV)
- (C) Critical threshold value (CTV)
- (D) Normal threshold value (NTV)

29. Which of the following is *not correct* for a major project ?
- (A) Substantial capital investment
  - (B) Cover large area
  - (C) Wide range impacts
  - (D) Employ less numbers
30. Which Article of the Indian Constitution mentioned about the ownership and control of the land resources of the country should be so distributed as best to serve the common good ?
- (A) Article 51
  - (B) Article 31
  - (C) Article 39
  - (D) Article 21
31. UNEP Headquarters is situated in which city ?
- (A) Rome
  - (B) Kyoto
  - (C) Beijing
  - (D) Nairobi
32. First U.N. Conference on Man & Environment was held in which city and year ?
- (A) London, 1962
  - (B) Stockholm, 1972
  - (C) Rio de Janeiro, 1992
  - (D) Paris 1982

33. "Itai Itai" disease spread was due to water contamination by which metal ?
- (A) Mercury
- (B) Lead
- (C) Cadmium
- (D) Arsenic
34. As per the notification, the coastal land upto how many meters from a stage along the banks of creeks, estuaries, backwater and rivers subject tidal fluctuations, is called the Coastal Regulation Zone :
- (A) 500 m
- (B) 300 m
- (C) 200 m
- (D) 100 m
35. Tiger is protected animal in which Schedule of the Wildlife Protection Act ?
- (A) Schedule 1
- (B) Schedule 2
- (C) Schedule 3
- (D) Appendix
36. The sound velocity in the air at 0°C is :
- (A) 1269 m/s
- (B) 331 m/s
- (C) 1435 m/s
- (D) 5130 m/s

37. The simple harmonic motion is represented by an elementary type of vibration with a.....frequency.
- (A) Dual
  - (B) Single
  - (C) Multiple
  - (D) Intermittant
38. What is *incorrect* about the mechanism of organic matter conversion to biogas in anaerobic digestion system ?
- (A) Hydrolysis process
  - (B) Methanogenesis process
  - (C) Acetogenesis process
  - (D) Methane oxidation process
39. Which of the homoacetogenic bacteria utilize H<sub>2</sub> and CO<sub>2</sub> during anaerobic digestion of feedstock ?
- (A) *Methanosarcina mazei*
  - (B) *Acetobacterium woodii*
  - (C) *Pseudomonas carboxydovorans*
  - (D) *Escherichia coli*
40. Correct order of wavelength in shorter to longer manner is :
- (A) IR > microwave > UV > Vis
  - (B) Microwave > UV > Vis > IR
  - (C) UV > Vis > IR > microwave
  - (D) Vis > UV > microwave > IR

41. Stratosphere is known to protect life on earth from harmful radiation from sun is found between :
- (A) Mesosphere & Thermosphere
  - (B) Thermosphere & Ionosphere
  - (C) Toposphere & Mesosphere
  - (D) Ionosphere & Exosphere
42. Eutrophication is caused due to :
- (A) Transport emissions
  - (B) Industrial emissions
  - (C) Biomass burning emissions
  - (D) Agricultural run off and domestic sewage
43. The pH of  $10^{-2}$  M KOH will be :
- (A) -2
  - (B) 2
  - (C) -12
  - (D) 12
44. Dispersion of pollution from stack is a function of.....
- (A) stability, wind and stack height
  - (B) stability, wind and stack diameter
  - (C) stability, wind and Air pollution control equipments
  - (D) stability, wind and stack attachment
45. The height of tropopause over the equator is about.....km.
- (A) 10
  - (B) 8
  - (C) 16
  - (D) 12

46. Dry adiabatic lapse rate is about .....°C/km.
- (A) 7
  - (B) 4.5
  - (C) 9.8
  - (D) 12
47. Which of the following is *not* a green-house gas ?
- (A) O<sub>3</sub>
  - (B) Ar
  - (C) CO<sub>2</sub>
  - (D) CH<sub>4</sub>
48. Wetlands located in the low-laying depressions and flood plains associated with :
- (A) Lakes
  - (B) Ponds
  - (C) Dammed water
  - (D) River
49. Fluoride in water mainly affects :
- (A) Teeth
  - (B) Brain
  - (C) Muscles
  - (D) Kidney
50. ....are genetically differentiated subspecies that are well adapted to the particular set of environmental condition :
- (A) Ecotypics
  - (B) Species
  - (C) Genera
  - (D) Bioacous

**JAN - 31218/II—B**

**ROUGH WORK**

**JAN - 31218/II—B**

**ROUGH WORK**