

Test Booklet No.

प्रश्नपत्रिका क्र.

M

## Paper-III

## ENVIRONMENTAL SCIENCE

Signature and Name of Invigilator

Seat No.

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(In figures as in Admit Card)

1. (Signature) .....

(Name) .....

Seat No. ....

(In words)

2. (Signature) .....

(Name) .....

OMR Sheet No.

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(To be filled by the Candidate)

DEC - 31313

Time Allowed : 2½ Hours]

[Maximum Marks : 150

Number of Pages in this Booklet : 20

Number of Questions in this Booklet : 75

## 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 75 objective type questions. Each question will carry two marks. All questions of Paper-III 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.  

|     |     |     |     |
|-----|-----|-----|-----|
| (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 महत्त्वाच्या सूचना

- परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
- सदर प्रश्नपत्रिकेत 75 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 मिनिटांमध्ये 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 चूकीचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनिटांतच पर्यवेक्षकाला परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी. त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही तसेच वेळही 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 उतरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळा/निळा करावा.  
**उदा.** : जर (C) हे योग्य उत्तर असेल तर.  

|     |     |     |     |
|-----|-----|-----|-----|
| (A) | (B) | (C) | (D) |
|-----|-----|-----|-----|
- या प्रश्नपत्रिकेतील प्रश्नांची उतरे ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत. इतर ठिकाणी लिहिलेली उतरे 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 गैरमार्गाचा 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 निळा किंवा काळा बॉल पेनचाच वापर करावा.
- कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.
- चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.

**DEC-31313/III**

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**Environmental Science****Paper III****Time Allowed : 2½ Hours]****[Maximum Marks : 150**

**Note :** This Paper contains **Seventy Five (75)** multiple choice questions, each question carrying **Two (2)** marks. Attempt *All* questions.

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. The term ‘Sustainable Development’ became popular after the UN Conference at ..... .</p> <p>(A) Rio de Janeiro</p> <p>(B) Stockholm</p> <p>(C) Kyoto</p> <p>(D) Montreal</p> <p>2. Sustainable development is not possible without ..... .</p> <p>(A) Prioritizing local aspirations</p> <p>(B) Integrating environmental concerns in planning</p> <p>(C) Monitoring environmental changes</p> <p>(D) Improving environmental legal framework</p> | <p>3. Future of mankind is dependent on .....</p> <p>(A) Keeping resources demands low</p> <p>(B) Sustainable use of natural resources</p> <p>(C) Solving local problems of pollution</p> <p>(D) Minimization of wastage of water</p> <p>4. Wind blows in a direction around a pressure centre in the following case.</p> <p>(A) Low pressure in the N.H. (clockwise)</p> <p>(B) High pressure in the S.H. (clockwise)</p> <p>(C) High pressure in the N.H. (clockwise)</p> <p>(D) Low pressure in the S.H. (anticlockwise)</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

5. The height of tropopause is maximum over :
- (A) The poles
  - (B) The equator
  - (C) The mid-latitude
  - (D) The sub-tropics
6. In case of temperature inversion in an atmospheric layer :
- (A) Lapse rate is positive
  - (B) Temperature is constant with the height
  - (C) Temperature decreases with the height
  - (D) Lapse rate is negative
7. Wind occurs because air tends to move from regions of higher to lower :
- (A) Latitude
  - (B) Pressure
  - (C) Nitrogen level
  - (D) Humidity
8. Which part of the India has the thickest lithosphere ?
- (A) Narmada
  - (B) Himalaya
  - (C) Sahyadri
  - (D) Eastern Ghat

9. Which of the following elements if present in groundwater *does not* have its source from parent rock Basalt ?
- (A) Ca  
(B) Mg  
(C) Cl  
(D) Fe
10. The detector used in atomic absorption spectrophotometry is :
- (A) Flame ionization detector  
(B) Photomultiplier tube  
(C) Electron capture detector  
(D) Photodiode
11. In order to prepare 50 mL of 0.2 N NaOH, how much volume of 0.5 N NaOH is needed ?
- (A) 20 mL  
(B) 10 mL  
(C) 5 mL  
(D) 2.5 mL
12. The unit for molar absorption coefficient is :
- (A) lit/mol/cm  
(B) lit mol<sup>-1</sup> cm<sup>-2</sup>  
(C) lit/mol. cm  
(D) lit-cm/mol<sup>2</sup>
13. Which gas is filled in G.M. counter for measurement of radioactivity ?
- (A) Xe  
(B) Ar  
(C) Ne  
(D) He

14. Which of the following indicators is used to determine total hardness of water ?
- (A) Methyl orange  
(B) Murexide  
(C) Erichrome black T  
(D) Phenolphthalein
15. Soil contains about ..... organic matter.
- (A) 10%  
(B) 40%  
(C) 30%  
(D) 80%
16. Which of the following shows the lowest solubility product ?
- (A) AgF  
(B) AgCl  
(C) AgBr  
(D) AgI
17. Which of the following plays important role in the formation of photochemical smog ?
- (A) O<sub>3</sub>  
(B) O<sub>2</sub>  
(C) NO  
(D) SO<sub>2</sub>
18. Normally at each stage much energy is lost in a food chain thus it usually limits the number of trophic levels to :
- (A) 10–15  
(B) 7–8  
(C) 4–5  
(D) 1–4

19. Human civilization is believed to have started with agriculture around ..... years ago.
- (A) 50,000  
(B) 15,000  
(C) 10,000  
(D) 5,000
20. Which of the following species should get priority in biodiversity conservation ?
- (A) rare  
(B) endangered  
(C) extinct  
(D) threatened
21. Ernst Haeckel is credited with having coined the word 'ecology' in .....
- (A) 1860  
(B) 1866  
(C) 1879  
(D) 1895
22. .... gets more protection to the area under the provisions of the Wildlife Protection Act.
- (A) National Park  
(B) Wildlife Sanctuary  
(C) Project Tiger Reserve  
(D) Biosphere Reserve

23. Which one of the following is *not* a by-product of photosynthesis ?
- (A) Heat
  - (B) Oxygen
  - (C) Sugar
  - (D) Carbon dioxide
24. The site of nitrogen fixation in the cyanobacteria is :
- (A) Vegetative cells
  - (B) Heterocysts
  - (C) Akinetes
  - (D) Chlamydo spores
25. Which of the following organisms causes aspergillosis ?
- (A) *Aspergillus nidulans*
  - (B) *Aspergillus niger*
  - (C) *Aspergillus flavus*
  - (D) *Aspergillus oryzae*
26. Which geological structure is the basic cause of earthquake ?
- (A) Fault
  - (B) Fold
  - (C) Joint
  - (D) Crack
27. Which of the following gases were most likely the largest components of the 'Early Atmosphere' ?
- (A)  $N_2, H_2O, CO_2, CH_4$  and  $NH_3$
  - (B)  $N_2$  and  $O_3$
  - (C) Ne, Kr, Ar and Rn
  - (D)  $C_2H_4$  and  $O_2$
28. Usually western disturbances produce rainfall and cloudiness over .....
- (A) Jammu Kashmir and Himachal Pradesh
  - (B) Maharashtra
  - (C) Orissa
  - (D) Konkan and Goa



29. Which of the following parts of India is frequently facing drought ?
- (A) Vidarbha
  - (B) Marathawada
  - (C) Orissa
  - (D) West Bengal
30. Monsoon depressions are weather system which :
- (A) Form over the Bay of Bengal and move inland in a North Easterly direction
  - (B) Form over the Bay of Bengal and move inland in North Westerly direction
  - (C) Form off the Konkan coast and move westwards
  - (D) Form off the Kerala coast and move eastwards
31. Groundwater mining in coastal areas can :
- (A) decrease the toxicity of groundwater
  - (B) decrease the salinity of groundwater
  - (C) increase the water table
  - (D) increase the salinity of groundwater
32. Which of the following is the most abundant fossil fuel ?
- (A) oil
  - (B) coal
  - (C) natural gas
  - (D) gasoline

33. Oil pools are generally associated with :
- (A) Folds or domes
  - (B) Joints and cracks
  - (C) Fault and unconformity
  - (D) Weak planes and fissures
34. What type of coal contains maximum percentage of carbon ?
- (A) Bituminous coal
  - (B) Anthracite
  - (C) Lignite
  - (D) Peat
35. Main feeding source for geothermal energy is :
- (A) Hot spot/convection current
  - (B) Volcanic eruption
  - (C) Earthquake activities
  - (D) Crustal displacement
36. The temperature at the mantle-surface crust boundary is about ..... degrees Celsius.
- (A) 375
  - (B) 475
  - (C) 575
  - (D) 675
37. Locations ideally suited for wind energy farm should be exploited in India. Such location exist in :
- (A) Gujrat coast
  - (B) West Bengal
  - (C) Vidarbha
  - (D) Punjab

38. Which of the following is the most commonly used energy resource ?
- (A) Fossil fuel
  - (B) Nuclear
  - (C) Wind power
  - (D) Chemical energy
39. Earth system land surface, oceans and atmosphere absorbs an average of ..... watts of solar power per sq.m.
- (A) 40
  - (B) 140
  - (C) 240
  - (D) 340
40. Which one of the following is *not* a green-house gas ?
- (A) Methane
  - (B) Water vapour
  - (C) Nitrous oxide
  - (D) Carbon monoxide
41. Thermal pollution selects :
- (A) Psychrophilic microbes
  - (B) Mesophilic microbes
  - (C) Thermophilic microbes
  - (D) Barophilic microbes
42. Which of the following groups of organisms include nitrogen fixers ?
- (A) Green algae
  - (B) Bacteria
  - (C) Viruses
  - (D) Fungi

43. The Eijkman test enables us to estimate faecal coliform bacteria because they are :
- (A) able to ferment lactose only
  - (B) able to ferment lactose at 37°C
  - (C) able to ferment lactose at 44°C
  - (D) unable to ferment lactose
44. Which of the following is a measure of biomass ?
- (A) MLSS
  - (B) Sludge
  - (C) MLVSS
  - (D) SS
45. Ambient air quality norms are dependent on :
- (A) nature of pollutant
  - (B) nature and concentration of pollutants
  - (C) concentration of pollutants
  - (D) location, type and concentration of pollutants
46. Anthropogenic sources of CO<sub>2</sub> emission are :
- (A) Wet lands
  - (B) Burning of Biomass
  - (C) Animal farm
  - (D) Spray painting

47. Which of the following is a primary pollutant ?
- (A) Carbon monoxide
  - (B) Ozone
  - (C) Water vapour
  - (D) Smog
48. Which of the following is a threshold of hearing ?
- (A) 90 dB
  - (B) 0 dB
  - (C) 20 dB
  - (D) 60 dB
49. Which part of NEPA (1969) deals with environmental impact assessment ?
- (A) Section 101
  - (B) Council on environmental quality
  - (C) Section 102
  - (D) Goal of environmental quality
50. Which of the following impact identification methods is based on the complex web of relationship in environmental system ?
- (A) Network
  - (B) Overlay maps
  - (C) Matrices
  - (D) Checklists
51. The planning balance sheet to present variation on the theme of cost benefit analysis was developed by :
- (A) Leopold et al
  - (B) Fairchild et al
  - (C) Lichfield et al
  - (D) Canter et al

52. Which key issue has played a significant role in the conflict related to Sardar Sarovar Project ?
- (A) Air pollution
  - (B) Vector-borne diseases
  - (C) Rehabilitation of outsees
  - (D) Submergence of forests
53. For maintaining food security of the country it is envisaged not to use ..... for any other purpose.
- (A) Horticulture lands
  - (B) Crop lands
  - (C) Pasture lands
  - (D) Forest lands
54. A better solution to fast growing Indian cities is .....
- (A) good infrastructure
  - (B) satellite cities
  - (C) self-reliant villages
  - (D) conversion into metros
55. The leachate generated in the sanitary landfills carries high load of:
- (A) Toxic metals
  - (B) Pesticides
  - (C) BOD/COD
  - (D) Nutrients
56. What is the C/N ratio required for composting of municipal solid waste ?
- (A) 10
  - (B) 50
  - (C) 40
  - (D) 30

57. As per the Wildlife (Protection) Act 1972 (amended, 91) ..... declares its intention.
- (A) The Central Government
- (B) The State Government
- (C) The Wildlife Advisory Board
- (D) The State Biodiversity Board
58. Coastal Regulation Zone (CRZ) has played a significant role in protecting :
- (A) Mining
- (B) Mangroves
- (C) Fisheries
- (D) Jetty and Harbours
59. The principal administrative authority for compensation award relief under Public Liability Act, 1991 is :
- (A) District Collector
- (B) Commissioner
- (C) Police Superintendent
- (D) Municipal Commissioner
60. Which of the following deals with the problem of water pollution ?
- (A) Narmada Bachao Movement
- (B) River Action Plan
- (C) Tehri Dam Movement
- (D) Silent Valley Action

61. Blood samples are collected from patients suffering from fever, to determine the nature of infection. The results of tests can be improved by :
- (A) taking more blood from each patient
  - (B) taking blood from more patients
  - (C) taking blood on multiple occasions
  - (D) using temperature data in addition to the result of blood test
62. Which of the following statements holds for the sampling distribution of sample mean ?
- (A) The sampling distribution shows how the sample is distributed around the sample mean
  - (B) The sampling distribution shows the effect of a change in the sample size
  - (C) The sampling distribution indicates whether sample mean is a good estimator of the population mean
  - (D) The standard error of the sample mean will decrease as the sample size increases
63. The arithmetic mean is one of the most common measures of central tendency. Identify another measures of central tendency among the following :
- (A) Standard deviation
  - (B) Range
  - (C) Median
  - (D) Variance



64. The normal distribution is important in statistics because :
- (A) Statistical tables for the normal distribution are easily available
  - (B) Every other distribution can be approximated by the normal distribution
  - (C) The sample mean approximately follows the normal distribution
  - (D) The normal distribution possesses some desirable properties
65. For a probability distribution, mean  $<$  variance. Then the distribution :
- (A) is Binomial
  - (B) is Poisson
  - (C) is neither binomial nor Poisson
  - (D) can be any of binomial and Poisson
66. A system of linear simultaneous equations is said to be consistent if :
- (A) any one of the equations can be derived from the other equations
  - (B) The system has at least one non-trivial solution
  - (C) The matrix of coefficients is non-singular
  - (D) The matrix of coefficients is singular
67. Population growth model provides a method of :
- (A) tracking and measuring growth of a population
  - (B) representing the population growth in a mathematical form
  - (C) measuring deviations from predicted growth
  - (D) Identifying the ideal growth pattern of the population

68. Which of the following represents in-situ method of waste management ?
- (A) Stabilisation of pollutant by using inoculum of selected microbes
  - (B) Stabilisation of pollutants by spraying molasses waste water
  - (C) Stabilisation of pollutants in anaerobic digester
  - (D) Stabilisation of pollutants in the activated sludge treatment system
69. Discharge of biomedical waste without any treatment into water bodies can result in spread of :
- (A) Nitrogen fixers
  - (B) Phosphate mobilisers
  - (C) Drug-resistant microbes
  - (D) Drug-sensitive microbes
70. Air pollution from urban areas can be possibly reduced by use of ..... in an affordable way.
- (A) Fuel efficient public transport system
  - (B) Banning automobiles
  - (C) Solar power for vehicles
  - (D) Hybrid vehicles
71. Working group on Adaptation to climate change of the IPCC has suggested various measures to combat the impacts of climate change in the regions of decreasing rainfall, one of these is :
- (A) using groundwater
  - (B) rain harvesting
  - (C) artificial rain making
  - (D) desalination of sea water

72. Most appropriate way of controlling eutrophication of lakes is by .....

- (A) catchment management
- (B) maintaining water levels
- (C) regulating discharge
- (D) removal of aquatic weeds

73. .... is the innovative way of water conservation adopted by farmers today.

- (A) drip irrigation
- (B) farm ponds
- (C) lift irrigation
- (D) counter-bunds

74. The WGEEP appointed by the MOEF is to look into .....

- (A) monitor legal and illegal mining operations
- (B) conservation of biodiversity of the region
- (C) proper implementation of the legislation
- (D) sustainable development of the Western Ghats

75. .... is the ideal way of restoration of lakes in India.

- (A) Removal of aquatic weeds
- (B) Desilting of lakes
- (C) Controlling incoming nutrients
- (D) Encouraging fishery activity

**DEC-31313/III**

**ROUGH WORK**

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