

Test Booklet Code &amp; No.

प्रश्नपत्रिका कोड व क्र.

**D****Paper-III****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)

**MAY - 31316****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)
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- 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**

- परिक्षार्थीनी 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 विद्यार्थ्याला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून घ्याव्यात.
  - 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 घ्यावी. पृष्ठे कमी असलेली/कमी प्रश्न असलेली/प्रश्नांचा चूकीचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनिटातच 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 उत्तरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळा/निळा करावा.  
**उदा. :** जर (C) हे योग्य उत्तर असेल तर.  

(A)	(B)	(C)	(D)
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- 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 खूप केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमागाचा अवलंब केल्यास विद्यार्थ्याला परीक्षेस अपात्र ठरविण्यात येईल.
- परीक्षा संपल्यानंतर विद्यार्थ्याने 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.**

**MAY - 31316/III—D**

## 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.

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|--|--|
| <p>1. In determining the noise status of a given area, the recommended index <math>L_{eq}</math> (as per noise control and prevention rules of CPCB) is determined or measured during day or night for the duration of :</p> <p>(A) 1 hour</p> <p>(B) 2 hours</p> <p>(C) 4 hours</p> <p>(D) 8 hours</p> <p>2. Accumulation mode atmospheric aerosols include particle between :</p> <p>(A) 1.0 – 10 <math>\mu\text{m}</math></p> <p>(B) 0.01 – 0.1 <math>\mu\text{m}</math></p> <p>(C) &gt; 2.5 <math>\mu\text{m}</math></p> <p>(D) 0.1 – 1.0 <math>\mu\text{m}</math></p> | <p>3. The correct order of different layers of the atmosphere is :</p> <p>(A) Troposphere, Stratosphere, Thermosphere, Mesosphere</p> <p>(B) Troposphere, Mesosphere, Thermosphere, Stratosphere</p> <p>(C) Troposphere, Stratosphere, Mesosphere, Thermosphere</p> <p>(D) Troposphere, Mesosphere, Stratosphere, Thermosphere</p> <p>4. With the increase in altitude, temperature increases in the :</p> <p>(A) Troposphere</p> <p>(B) Stratosphere</p> <p>(C) Mesosphere</p> <p>(D) Stratosphere and mesosphere</p> |
|--|--|

5. The resultant of two noise levels of 80 dB each, will be :
- (A) 86 dB
  - (B) 160 dB
  - (C) 120 dB
  - (D) 83 dB
6. Acid rain has its pH :
- (A) Below 7.0
  - (B) Below 5.6
  - (C) Between 5.6 and 7
  - (D) Above 5.6
7. The *correct* order of abundance of CH<sub>4</sub>, O<sub>2</sub> and He in air is :
- (A) He > O<sub>2</sub> > CH<sub>4</sub>
  - (B) O<sub>2</sub> > He > CH<sub>4</sub>
  - (C) O<sub>2</sub> > CH<sub>4</sub> > He
  - (D) He > CH<sub>4</sub> > O<sub>2</sub>
8. The quantification of the anticipated impacts of the proposed project on environmental factors is referred as :
- (A) Impact prediction
  - (B) Weighing of impact
  - (C) Impact monitoring
  - (D) Reduction of impacts
9. Public participation in EIA is a ..... mechanism.
- (A) Information feedback
  - (B) Information feed forward
  - (C) Information feed forward and feedback
  - (D) one way communication
10. Lakes and water bodies are better restored by the way of :
- (A) controlling surface temperature
  - (B) controlling incoming nutrients
  - (C) controlling the zooplanktons
  - (D) controlling the dissolved oxygen

11. Which of the following is an example of a simple matrix ?
- (A) Canter et al (1976)
  - (B) Leopold et al (1971)
  - (C) Horner et al (1986)
  - (D) Munero et al (1986)
12. As a part of the environmental clearance public hearing is required for the project :
- (A) construction of housing
  - (B) construction of commercial project
  - (C) construction of dam on river
  - (D) industrial unit in notified industrial zone
13. One of the following developments is NOT exempted from CR2-I area :
- (A) construction of a jetty
  - (B) expansion of existing construction
  - (C) salt cultivation
  - (D) stilts for bridge across the water way
14. The gross precipitation is  $1100 \text{ m}^3$ , whereas the net precipitation is  $800 \text{ m}^3$ . What is the interception for a year ?
- (A)  $1900 \text{ m}^3$
  - (B)  $300 \text{ m}^3$
  - (C)  $1400 \text{ m}^3$
  - (D)  $8800 \text{ m}^3$

15. Ministry of Environmental and Forests has classified the biomedical waste into how many categories ?

- (A) 10 categories
- (B) 16 categories
- (C) 12 categories
- (D) 14 categories

16. The processes of composting, anaerobic digestion, and incineration are employed for :

- (A) Waste segregation
- (B) Waste transformation
- (C) Waste collection
- (D) Waste transportation

17. With which of the following amendments the Article 48(A) and Article 51(A) (g) have been included in Indian Constitution for the protection of environment ?

- (A) 43rd Amendment
- (B) 46th Amendment
- (C) 48th Amendment
- (D) 42nd Amendment

18. Declaration of an area as National Park or Wildlife Sanctuary is provided in :

- (A) The Environment (Protection) Act, 1986
- (B) The Forest (Conservation) Act, 1980
- (C) The Biodiversity (Conservation) Act, 2006
- (D) The Wildlife (Protection) Act, 1972

19. Waste from hospitals lacking incineration or sterilization facilities are .....
- (A) Collecting waste in plastic bags for landfilling
- (B) Collecting waste in containers for composting and for disposal at specific sites
- (C) Segregating and packing the waste in special colour code and labelled containers for treating elsewhere prior to landfilling
- (D) Collecting the waste in one container for treating at other place and further disposal
20. Which one of the following gases is generated in large quantity under anaerobic digestion of organic matter?
- (A)  $\text{HO}_2$
- (B)  $\text{CO}_2$
- (C)  $\text{CH}_4$
- (D)  $\text{SO}_2$
21. The average garbage generation by Indian population is .....
- (A) 0.33 kg/capita/day
- (B) 0.8 kg/capita/day
- (C) 1.0 kg/capita/day
- (D) 0.05 kg/capita/day
22. In multiple regression equation  $y = \alpha + \sum_i \beta_i x_i + \epsilon$ ; the value of  $\text{var}(\epsilon)$  is :
- (A) 0
- (B)  $\sigma^2$ , where  $\sigma$  standard deviation
- (C) +1
- (D) -1

23. A city of square shape and of length 15 km has an inversion layer of height 40 m. The transport sector emits CO of amount  $1.1 \times 10^{-4}$  gm/m<sup>2</sup> per sec at 5 P.M. in the evening. If the winds of speed of 1.0 m/s bring clean air to the city, the CO concentration according to box model after 2 hours will be :

- (A) 32 mg/m<sup>2</sup>
- (B) 3.2 mg/m<sup>2</sup>
- (C) 16 mg/m<sup>2</sup>
- (D) 3.2 g/m<sup>3</sup>

24. In Gaussian plume dispersion model the plume rise is taken as a function of :

- (A) buoyancy flux parameter only
- (B) buoyancy flux parameter, wind speed and atmospheric stability parameter
- (C) Wind speed and atmospheric stability parameter
- (D) buoyancy flux parameter, relative humidity and wind speed

25. The size distribution of aerosols in urban areas is commonly of the type :

- (A) Poisson
- (B) Binomial
- (C) Normal
- (D) Log-normal

26. The eigen value(s) of the matrix :

$$\begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 1 \\ 4 & 0 & 1 \end{bmatrix}$$

is :

- (A) 3
- (B) 1 and 2
- (C) 3, 1 and 2
- (D) 1, 2 and 4

27. The population of a country at the time of its independence was 350 million. Its population after 5 decades became 1050 million. Assuming that the growth rate of population is exponential, what is its growth rate :
- (A) ~ 2.19 % per year  
(B) ~ 3.2 % per year  
(C) ~ 5.2 %  
(D) ~ 1.8 %
28. Recently Govt. of India constituted a high power committee for biodiversity conservation in :
- (A) Himalayan ranges  
(B) Western Ghats  
(C) Ridge area  
(D) North-East region
29. When it rains 2000 mm in a season on 100 sq. meters roof area, the amount of water harvested at 50% efficiency, will be :
- (A) 50 m<sup>3</sup>  
(B) 100 m<sup>3</sup>  
(C) 200 m<sup>3</sup>  
(D) 400 m<sup>3</sup>
30. According to the general agreement among the UN member states, there is a need to limit the rise in average surface temperature of the earth at the end of 2050 by :
- (A) 3 to 4.5 °C  
(B) 1.5 to 2°C  
(C) 1 to 1.5 °C  
(D) 0.5 to 1°C

31. Emissions of ozone depleting substances are controlled under :
- (A) Montreal protocol
  - (B) Kyoto protocol
  - (C) Bali declaration
  - (D) Copenhagen Summit
32. The provisions of environmental protection in the constitution were made under Article :
- (A) 5-A
  - (B) 21-B
  - (C) 27-B
  - (D) 48-A and 51-A
33. ENVIS centres have been started by Ministry of Environment and Forest to .....
- (A) Impart training to student
  - (B) Spread awareness among masses about environment
  - (C) Disseminate environmental information
  - (D) Carry out environmental research
34. Soot is contributed as a major air pollutant mainly from :
- (A) CNG driven transport
  - (B) Diesel driven transport
  - (C) Petrol driven vehicles
  - (D) Biofuel driven vehicles
35. Which of the following protocols/ conventions is aimed at controlling of transboundary movement of hazardous waste :
- (A) Basal convention
  - (B) Ramsar convention
  - (C) Kyoto protocol
  - (D) Montreal protocol

36. Which one of the following is not a greenhouse gas ?

(A)  $\text{CH}_4$

(B)  $\text{CO}_2$

(C)  $\text{O}_3$

(D)  $\text{N}_2$

37. First International Convention (HN)

on Human Environment was held

in :

(A) March 1968

(B) March 1970

(C) June 1970

(D) June 1972

38. More than 97% of water on the earth is found in the oceans. The second largest compartment in the global hydrologic cycle is the ice at the poles and in glaciers. The rest of the earth's water is mostly in the :

(A) Rivers

(B) Lakes

(C) Atmosphere

(D) Groundwater

39. In the atmosphere an adiabatic process is one in which :

(A)  $dT = 0$

(B)  $dp = 0$

(C)  $dh = 0$

(D)  $d\rho = 0$

40. The most abundant and most used noble gas refers to :
- (A) Argon
  - (B) Neon
  - (C) Oxygen
  - (D) Nitrogen
41. The principle on matter is neither created nor destroyed but simply changes from one form to another is known as :
- (A) Law of conservation of matter
  - (B) Law of conversion of matter
  - (C) Law of thermodynamics
  - (D) Law of conservation of energy
42. Region within ~ 80 km of the earth's surface where there is chemical homogeneity, is :
- (A) Homosphere
  - (B) Heterosphere
  - (C) Tratosphere
  - (D) Mesosphere
43. Cobalt sulphate solution shows an absorbance of 0.3, how much will be its percentage transmittance ?
- (A) 10
  - (B) 20
  - (C) 50
  - (D) 40
44. The gas which is readily adsorbed by activated charcoal is :
- (A) N<sub>2</sub>
  - (B) O<sub>2</sub>
  - (C) H<sub>2</sub>
  - (D) SO<sub>2</sub>
45. Which of the following are independently capable of utilising atmospheric nitrogen as their nutrient source ?
- (A) Plants
  - (B) Animals
  - (C) Birds
  - (D) Microorganisms

46. Hollow cathode lamp is used in :
- (A) Gas chromatograph
  - (B) Microscope
  - (C) Atomic absorption spectrometer
  - (D) Detector of HPLC
47. Which of the following is a critical organ for radioisotope of iodine ?
- (A) Kidney
  - (B) Lung
  - (C) Thyroid
  - (D) Pancreas
48. Formation of smog does NOT depend on :
- (A) Sunlight
  - (B)  $\text{NO}_2$  levels
  - (C) Wind speed
  - (D) GHG levels
49. Which one of the following is responsible for acid rain formation ?
- (A)  $\text{N}_2\text{O}$  and  $\text{SO}_2$
  - (B)  $\text{CO}_2$  and  $\text{NO}_2$
  - (C)  $\text{NO}_2$  and  $\text{SO}_2$
  - (D)  $\text{NO}_2$  and  $\text{CH}_4$
50. Relatively higher pH of rain water is noticed mainly due to :
- (A) high sea salt content
  - (B) higher interference of  $\text{CaCO}_3$  rich dust
  - (C) Low sea salt content
  - (D) Low intensity of rainfall

51. The relationship between two organisms in which one is benefitted and other harmed is .....

- (A) Parasitism
- (B) Symbiosis
- (C) Commensalism
- (D) Mutualism

52. A trophic level in an ecosystem refers to .....

- (A) Area in the tropics
- (B) An organism's position in a food chain
- (C) An organism's position in phylogeny
- (D) An organism's position in a ontogeny

53. In an aquatic ecosystem phytoplankton can be considered as .....

- (A) Consumers
- (B) Producers
- (C) Saprophytic organisms
- (D) Macro consumers

54. In ecosystem maintains a state of stable through a balance between all associated components is known as :

- (A) Allelopathy
- (B) Homeostatis
- (C) Acetolysis
- (D) Polymorphism

55. Xerophytes are the plants growing in .....

- (A) Ocean
- (B) Desert
- (C) Intertidal zones
- (D) Wetlands

56. The best known and accepted theory of chemical evolution suggesting that life began on earth's surface in areas where organic chemicals are accumulated, is :
- (A) Oparin-Haldane theory
  - (B) Haldane-Khurana theory
  - (C) Miller and Harold theory
  - (D) Maxwell and Miller theory
57. Which of the following terminologies is associated with the vertical structure of the forest ?
- (A) Canopy
  - (B) Understory
  - (C) Forest floor
  - (D) Back store
58. Which one of the following satellites is an example for active remotes sensing ?
- (A) IRS 1D
  - (B) RADARSAT
  - (C) LANDSAT
  - (D) SPOT
59. Which process provides most of the oxygen found in earth's atmosphere ?
- (A) Aerobic respiration
  - (B) Photosynthesis
  - (C) Fermentation
  - (D) Ecosystem
60. Landscape ecology is best described as study of :
- (A) Abiotic factors and the community of species
  - (B) Related arrays of ecosystems
  - (C) Physiological and behavioural ways in which organisms meet the challenges of their environment
  - (D) The array of interacting species within a community

61. Psychrometer is an instrument used to measure :

- (A) Amount of actual evapotranspiration
- (B) Atmospheric pressure
- (C) Relative humidity of air
- (D) Relative density of liquids

62. Tundra biome is characterised by :

- (A) Stunted trees and permanently frozen subsoil surface
- (B) Lack of trees and permanently frozen subsoil surface
- (C) Evergreen trees and permanently frozen subsoil surface
- (D) Coniferous trees with subsoil surface

63. The environmental lapse rate is found to be :

- (A)  $6.5^{\circ}\text{C}/\text{km}$
- (B)  $8.6^{\circ}\text{C}/\text{km}$
- (C)  $6.5^{\circ}\text{C}/\text{km}$
- (D)  $5.6^{\circ}\text{C}/\text{km}$

64. Groundwater resources are mainly becoming scarce because of :

- (A) Lack of rain
- (B) Excessive rains
- (C) Overexploitation
- (D) Low percolation

65. Ocean salinity is low in the equatorial region, because :

- (A) the region is characterised by heavy rainfall, cloudiness and humidity
- (B) the region contains evergreen forest
- (C) the region is covered by lavas of younger ages
- (D) the region is covered with good agricultural land

66. In the spectral distribution of the solar irradiance at the earth's mean distance (uninfluenced by any atmosphere) the share of visible radiations is about :
- (A) 75%
  - (B) 60%
  - (C) 45%
  - (D) 35%
67. Ethanol is produced from molasses by fermentation process using :
- (A) Saccharomyces
  - (B) Methanococcus
  - (C) Pseudomonas
  - (D) E.coli
68. Bioethanol produced from rice straw is :
- (A) chemically same as ethanol product from sugars
  - (B) has one extra carbon atom
  - (C) has one extra water molecule
  - (D) has different molecular weight
69. The following causes emission of greenhouse gas(es) :
- (A) Deep well
  - (B) Shallow rivers
  - (C) Paddy fields
  - (D) Tube wells
70. International 'Sun' day is celebrated on :
- (A) 5th June
  - (B) 5th May
  - (C) 8th March
  - (D) 9th August
71. Oceanic tides are caused by :
- (A) Gravity of mars
  - (B) Luminosity of sun
  - (C) Gravitational forces of sun and moon
  - (D) Gravitational force of earth

72. How much is the percentage range of methane in biogas ?
- (A) 50–68%
  - (B) 2–10%
  - (C) 10–15%
  - (D) 90–95%
73. Fluoride pollution injury to plants is indicated by leaves in the form of :
- (A) chlorosis of the interveinal region
  - (B) glazing and shining of lower epidermis
  - (C) leaf tip and margin browning
  - (D) bleached dots on lamina
74. Which of the following indicators is used in COD measurement of water ?
- (A) Ferroin
  - (B) Methylene blue
  - (C) Rose benyal
  - (D) Erichrome black T
75. The fuel gas desulphurization sludge (FGDS) is produced during the trapping of sulphur dioxide from thermal power plant by using .....
- (A) Calcium chloride slurry
  - (B) Sodium hydroxide solution
  - (C) Calcium hydroxide or limestone slurry
  - (D) Sodium borate slurry

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**ROUGH WORK**

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