

Test Booklet Code & Serial No.

प्रश्नपत्रिका कोड व क्रमांक

**Paper-II**

**B**

**ENVIRONMENTAL SCIENCE**

**Signature and Name of Invigilator**

Seat No.

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1. (Signature) .....

(In figures as in Admit Card)

(Name) .....

Seat No. ....

(In words)

2. (Signature) .....

(Name) .....

OMR Sheet No.

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(To be filled by the Candidate)

**JUN - 31219**

**Time Allowed : 2 Hours]**

**[Maximum Marks : 200**

**Number of Pages in this Booklet : 24**

**Number of Questions in this Booklet : 100**

**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 **100** objective type questions. Each question will carry *two* marks. *All* questions of Paper II will be compulsory.
- 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 महत्वाच्या सूचना**

- परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
- सदर प्रश्नपत्रिकेत **100** बहुपर्यायी प्रश्न आहेत. प्रत्येक प्रश्नास **दोन** गुण आहेत. या प्रश्नपत्रिकेतील **सर्व** प्रश्न सोडविणे अनिवार्य आहे.
- परीक्षा सुरू झाल्यावर विद्यार्थ्यांला 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 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 वेळही वाढवून मिळणार नाही याची कृपया विद्यार्थ्यांनी नोंद घ्यावी.
  - वरीलप्रमाणे सर्व पडताळून पाहिल्यानंतरच 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/निळ्या करावा.

**उदा. :** जर (C) हे योग्य उत्तर असेल तर.

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 व्यतिरीक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खूण 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. तथापि, 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.

**JUN - 31219/II—B**

**Environmental Science****Paper II****Time Allowed : 120 Minutes]****[Maximum Marks : 200****Note : This Paper contains Hundred (100) multiple choice questions. Each question carrying Two (2) marks. Attempt All questions.**

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|---|--|
| <p>1. Arrange the following greenhouse gases in the increasing order of their Global Warming Potential (GWP) :</p> <p>(A) <math>\text{N}_2\text{O} &lt; \text{SF}_6 &lt; \text{CH}_4</math></p> <p>(B) <math>\text{SF}_6 &lt; \text{N}_2\text{O} &lt; \text{CH}_4</math></p> <p>(C) <math>\text{CH}_4 &lt; \text{N}_2\text{O} &lt; \text{SF}_6</math></p> <p>(D) <math>\text{SF}_6 &lt; \text{CH}_4 &lt; \text{N}_2\text{O}</math></p> <p>2. Decay of one <math>\alpha</math>-particle from Thorium (<math>{}_{90}\text{Th}^{232}</math>) will result in :</p> <p>(A) <math>{}_{90}\text{Th}^{231}</math></p> <p>(B) <math>{}_{88}\text{Ra}^{228}</math></p> <p>(C) <math>{}_{88}\text{Ra}^{223}</math></p> <p>(D) <math>{}_{88}\text{Ra}^{226}</math></p> <p>3. Gypsum is :</p> <p>(A) <math>\text{CaCO}_3</math></p> <p>(B) <math>\text{CaSO}_4 \cdot 2\text{H}_2\text{O}</math></p> <p>(C) <math>\text{CaCl}_2</math></p> <p>(D) <math>\text{CaF}_2</math></p> | <p>4. Out of As, Bi, Sb and graphite semimetals, which one of the following is considered as metalloid ?</p> <p>(A) Bi</p> <p>(B) As</p> <p>(C) Sp</p> <p>(D) Graphite</p> <p>5. Immobilization of sulphur in soil occurs when the C : S ratio is :</p> <p>(A) Below 50 : 1</p> <p>(B) Below 100 : 1</p> <p>(C) Below 200 : 1</p> <p>(D) Above 400 : 1</p> <p>6. Mass spectrometer separates ions based on the :</p> <p>(A) Charge</p> <p>(B) Mass</p> <p>(C) Mass to charge ratio</p> <p>(D) Molecular weight</p> |
|---|--|
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7. The use of buffer eluent is common in :
- (A) Atomic absorption spectrometer (AAS)
  - (B) Gas chromatography
  - (C) High performance liquid chromatography
  - (D) Capillary electrophoresis
8. In the process of dynamic dilution to quantify odor in water, the meaning of olfactory perception threshold is :
- (A) 25% of the jury perceives the odor
  - (B) 50% of the jury perceives the odor
  - (C) 75% of the jury perceives the odor
  - (D) 100% of the jury perceives the odor
9. Temporary hardness of water is caused due to :
- (A) Magnesium chloride
  - (B) Magnesium sulphate
  - (C) Magnesium carbonate
  - (D) Calcium sulphate
10. Out of the following, the first step of water treatment is :
- (A) Filtration
  - (B) Coagulation
  - (C) Chlorination
  - (D) Sedimentation
11. Which one of the following is a micronutrient for plants ?
- (A) S
  - (B) B
  - (C) Ca
  - (D) P

12. Gas used as fuel in Atomic Absorption spectrometry is :
- (A) Air  
(B) Nitrogen  
(C) Acetylene  
(D) Nitrous oxide
13. How many Nickel atoms are present in 25 g Ni (MW of Nickel is 58.71 g) ?
- (A)  $52.7 \times 10^{23}$  atoms of Ni  
(B)  $25.7 \times 10^{23}$  atoms of Ni  
(C)  $2.57 \times 10^{23}$  atoms of Ni  
(D)  $5.27 \times 10^{23}$  atoms of Ni
14. The following reaction is an example of  $\text{CuCO}_3 \longrightarrow \text{Cu} + \text{CO}_2$
- (A) Acid base reaction  
(B) Chemiluminescence  
(C) Thermal decomposition  
(D) Photometry
15. Calculate molar mass of  $\text{HNO}_3$  :
- (A) 48 g/mol  
(B) 63 g/mol  
(C) 62 g/mol  
(D) 49 g/mol
16. Factors influencing the environmental gradients in species diversity are :
- (A) Temperature  
(B) Rainfall  
(C) Potential evapotranspiration  
(D) All of the above
17. In a deep water lake zonation of water bodies w.r.t. levels from top to bottom of D.O. and temperature are different zones are :
- (A) Epilimnion  $\rightarrow$  Hypolimnion  $\rightarrow$  Mesolimnion  
(B) Mesolimnion  $\rightarrow$  Epilimnion  $\rightarrow$  Hypolimnion  
(C) Hypolimnion  $\rightarrow$  Mesolimnion  $\rightarrow$  Epilimnion  
(D) Epilimnion  $\rightarrow$  Mesolimnion  $\rightarrow$  Hypolimnion

18. Which one of the following zones in a deep water lake is known as Dark Zone ?
- (A) Littoral zone
  - (B) Epilimnion zone
  - (C) Mesolimnion zone
  - (D) Hypolimnion zone
19. Any organism that obtains its nutrition from dead organic material is known as :
- (A) Autotrophs
  - (B) Heterotrophs
  - (C) Saprotrophs
  - (D) Chemotrophs
20. Blue baby syndrome is caused to the human infants due to :
- (A) Nitrate
  - (B) Sulphate
  - (C) Calcium
  - (D) Potassium
21. Oxidation pond method used for treatment of clarified sewage work on :
- (A) Bacteria
  - (B) Algae
  - (C) Bacteria and Algae
  - (D) All of the above
22. One of the following organisms is most commonly used as biofertilizer :
- (A) *Choococcus*
  - (B) *Pediastrum*
  - (C) *Nostoc*
  - (D) *Aphanocapsa*
23. Which one of the following is observed when analyse sewage polluted water ?
- (A) Low level of plant nutrient and excess growth of algae
  - (B) Low growth of algae and less D.O.
  - (C) High concentration of nutrients and low growth of algae
  - (D) High concentration of nutrients and excess growth of algae

24. Which of the following is NOT used for bringing about bioconversion of different substances ?
- (A) Yeasts
  - (B) Molds
  - (C) Bacteria
  - (D) Viruses
25. Azolla is used as a biofertilizer as it has ..... that fixes nitrogen.
- (A) Rhizobium
  - (B) Anabaena
  - (C) Mycorrhiza
  - (D) Azotobacter
26. Which of the following are air-borne viral diseases ?
- (A) Chickenpox, influenza, measles
  - (B) Polio, rabies
  - (C) Tuberculosis, diphtheria
  - (D) Cholera, typhoid
27. Contaminated water can spread disease like :
- (A) TB (Tuberculosis)
  - (B) Typhoid
  - (C) Tetanus
  - (D) Diphtheria
28. Pick the odd one out :
- (A) Agrobacterium – horseradish
  - (B) Azolla – Anabaena
  - (C) Frankia – Alder
  - (D) Rhizobium – Peas
29. The ocean thermal energy conversion system that is meant to generate power is most suitable in :
- (A) Sub-tropical region
  - (B) Tropical region
  - (C) Cold region
  - (D) Moderate climate region

30. Primary cosmic rays are composed of very energetic :
- (A) Electron
  - (B) Mesons
  - (C) Protons
  - (D) Neutron
31. A discordant igneous intrusion is known as :
- (A) Lopolith
  - (B) Laccolith
  - (C) Dyke
  - (D) Sill
32. Solifluction is a ..... type of mass movement.
- (A) Subsidence
  - (B) Slide
  - (C) Rapid flow
  - (D) Slow flow
33. .... denotes all rectilinear or curvilinear features observed on remotely sensed data products which are of geologic origin that reflect underlying structure.
- (A) Lineament
  - (B) Linear
  - (C) Line
  - (D) Superlineament
34. The orbit of the satellite around the earth that keeps pace with rotation of earth is known as :
- (A) Sunsynchronous orbit
  - (B) Geostationary orbit
  - (C) Low earth orbit
  - (D) Elliptical orbit
35. An automated system for capture, storage, retrieval, analysis and display of spatial data is known as :
- (A) GPS
  - (B) Landsat
  - (C) GIS
  - (D) Radiometer



36. Which of the following is NOT a social impact ?

- (A) Demographic
- (B) Cultural
- (C) Gender
- (D) Investment

37. Scoping in EIA :

- (i) is a systematic exercise that establishes the boundaries of EIA.
- (ii) clearly establishes/indicates what is relevant and what is not.
- (iii) serves as a work plan for the entire EIA process.

Which of the following are *true* ?

- (A) (i) and (ii)
- (B) (i) and (iii)
- (C) (ii) and (iii)
- (D) All of the above

38. Which of the following is NOT a part of Environmental Management Plan in EIA ?

- (A) Monitoring
- (B) Implementation schedule and cost estimates
- (C) TOR
- (D) Mitigation

39. Which category of projects does not require Environmental Impact Assessment in accordance with Indian EIA notification 2006 ?

- (A) Category B<sub>2</sub>
- (B) Category B<sub>1</sub>
- (C) Category A
- (D) Category C

40. Which is the Umbrella Act of the Government of India for Protection and Conservation of Environment ?
- (A) Water (P & CP) Act, I
  - (B) Air (P & CP) Act
  - (C) Wildlife Conservation Act
  - (D) Environmental Protection Act
41. Schedule II of the Hazardous Waste (Management Handling and Transboundary Movement) Rules, 2016 gives :
- (A) List of processes generating hazardous waste
  - (B) List of waste constituents with concentration limits
  - (C) List of hazardous wastes applicable for import and export not requiring prior informed consent
  - (D) List of hazardous wastes for import requiring prior informed consent
42. Which of these biomedical wastes are to be disposed in yellow colour coded container as per the Biomedical Waste (Management and Handling) Rules, 2016 ?
- (A) Human anatomical, animal, microbiology and biotechnology wastes
  - (B) Waste sharps
  - (C) Glassware
  - (D) Liquid waste
43. Montreal Protocol is related to :
- (A) Greenhouse gas emission reduction
  - (B) Reducing ozone depleting substances
  - (C) Climate change protocol
  - (D) Hazardous waste

44. The following are the types of environmental audit :
- (A) Liabilities Audit
  - (B) Waste Audits
  - (C) EMS Audit
  - (D) All of the above
45. Biological treatment of waste water removes :
- (A) Suspended organic solids
  - (B) Dissolved organic solids
  - (C) Dissolved inorganic solids
  - (D) All of the above
46. Select the attached growth process from the following :
- (A) Anaerobic Contact Process
  - (B) Activated Sludge Process
  - (C) Rotating Biological Contactor
  - (D) Upflow Anaerobic Sludge Blanket
47. BOD of effluents discharged in inland surface waters should not exceed :
- (A) 30 mg/L
  - (B) 50 mg/L
  - (C) 10 mg/L
  - (D) 100 mg/L
48. Which of the following can remove particulate as well as gaseous pollutants from air emissions ?
- (A) Wet scrubber
  - (B) Cyclone
  - (C) Electrostatic precipitation
  - (D) Bag filter
49. A size of plot for vegetation studies is decided on the basis of :
- (A) No. of species
  - (B) Area covered by vegetation
  - (C) Species-Area curve
  - (D) Random

50. The term species richness in biodiversity study refers to :
- (A) Number of genera in an area
  - (B) Number of species in an area
  - (C) Species composition in an area
  - (D) Relative abundance of species in an area
51. The continuous increase in concentration of a toxicant at successive trophic levels in a food chain is :
- (A) Bioremediation
  - (B) Biotransformation
  - (C) Bioaugmentation
  - (D) Biomagnification
52. Dams during their early stages of formation are relatively barren and nutrient deficient supporting very poor aquatic life are :
- (A) Epiphytic
  - (B) Parasitic
  - (C) Oligotrophic
  - (D) Saprophytic
53. Which one of the following agencies has been designated by the Ministry of Environment, Forest and Climate Change for Indian Eco-Mark Scheme ?
- (A) Board of Indian Standards
  - (B) Bureau of Indian Standards
  - (C) Directorate of Marketing
  - (D) Directorate of Plant Protection

54. "Salt water intrusion" in the coastal area is :

- (A) A flow of saline water on the land through estuary
- (B) An entry of saline water in a freshwater aquifer
- (C) An increase in salinity due to waterlogging
- (D) An entry of marine water in river in delta region

55. The process of formation of soil through the breaking down of rocks is called :

- (A) Biogenesis
- (B) Pedogenesis
- (C) Biodegradation
- (D) Biomagnification

56. The soil formed by the decomposition of silt brought by rivers is called .....

- (A) Red soil
- (B) Black soil
- (C) Alluvial soil
- (D) Pod soil

57. Soil without living organisms is referred as .....

- (A) Fertile soil
- (B) Subfertile soil
- (C) Humus
- (D) Mineral substrate

58. Dodo is a flightless bird which is :

- (A) Rare
- (B) Extinct
- (C) Endangered
- (D) Critically endangered

59. Net primary productivity in an ecosystem refers to :

- (A) Apparent photosynthesis
- (B) Total assimilation
- (C) Total photosynthesis
- (D) Assimilation

60. Phytoplankton stage during hydrosere development include the following community :

- (A) Vallisnaria, Utricularia, Hydrilla
- (B) Blue green algae, green algae, diatoms
- (C) Typha, Sagittaria, Phragmites
- (D) Nelumbo, Nymphaea, Limnanthemum

61. Match the following :

**Reactivity of Substance**

- (a) Spontaneously and/or vigorously react with water
- (b) Spontaneously and/or vigorously react with air
- (c) Generate toxic fumes
- (d) Explosive substance

**Example**

- (i) Dynamite
- (ii) Aluminium nitrate
- (iii) Phosphorous pentaoxide
- (iv) Trimethyl aluminium

**Codes :**

- (a) (b) (c) (d)
- (A) (iii) (i) (iv) (ii)
- (B) (iv) (iii) (ii) (i)
- (C) (i) (ii) (iii) (iv)
- (D) (iii) (iv) (ii) (i)

62. Which of the following components of solid waste is reclaimed by mechanical recovery ?
- (A) Food  
(B) Plastics  
(C) Leaves and plant debris  
(D) Metals
63. Which of the following is ecofriendly process of solid waste management ?
- (A) Incineration  
(B) Landfilling  
(C) Open dumping  
(D) Conversion into Compost/  
Biogas/Bioethanol
64. The GRIHA rating was developed by :
- (A) ISO  
(B) TERI  
(C) MoEFCC  
(D) IGBC
65. Calculate the resultant noise of four machines emitting the equal sound level of 60 dB(A) :
- (A) 120 dB(A)  
(B) 90 dB(A)  
(C) 63 dB(A)  
(D) 66 dB(A)
66. Which one of the following is NOT a natural factor that can affect watershed health ?
- (A) Fires  
(B) Mining  
(C) Floods  
(D) Earthquakes
67. Who was the founder of Appiko movement in Uttara Kannada ?
- (A) Pandurang Hegde  
(B) Ganesh Gauda  
(C) Appa Swamy  
(D) Sunderlal Bahuguna

68. Match the following :

**Waste Separation Techniques**

- (a) Stripping
- (b) Precipitation
- (c) Sorption
- (d) Solvent extraction

**Pollutants Separated**

- (i) Toxic metals
- (ii) Oils and organochlorine compounds
- (iii) Ethanol
- (iv) Xylene

**Codes :**

- (a) (b) (c) (d)
- (A) (i) (ii) (iii) (iv)
- (B) (iii) (i) (iv) (ii)
- (C) (iv) (iii) (ii) (i)
- (D) (ii) (iv) (i) (iii)

69. Which of the following is an example of stepped matrix ?

- (A) Leopold et al (1971)
- (B) Johnson and Bell (1975)
- (C) Carstea et al (1976)
- (D) Asian Development Bank (1987)

70. Which of the following is *wrong* sentence related to Koyto Protocol ?

- (A) Koyto Protocol was adopted in 1997
- (B) The first commitment period of this Protocol ended in 2012
- (C) The Protocol is about the reduction of Greenhouse gases
- (D) The second commitment period of the Protocol will end in 2030



71. Emergent woody plants that tolerate salinity of the open sea are known as :
- (A) Grasses
  - (B) Herbs
  - (C) Shrubs
  - (D) Mangroves
72. Which one of the plant species occurs in mangrove ecosystem ?
- (A) *Rhizophora*
  - (B) *Azadirachta*
  - (C) *Mangifera*
  - (D) *Casurina*
73. For a certain Normal distribution, the first moment about 10 is 40. What is the arithmetic mean ?
- (A) 40
  - (B) 30
  - (C) 50
  - (D) 20
74. Which of the following is NOT a weakness in the Gaussian Plume Model ?
- (A) The model does not evaluate dispersion in all three dimensions
  - (B) The model cannot be used for reactive pollutants
  - (C) The model is dependent upon steady-state conditions
  - (D) The model is not designed as a long-term air shed pollutant evaluator
75. Which of the following cross validation technique is best suited for time series data ?
- (A) K-fold cross validation
  - (B) Leave-one-out cross validation
  - (C) Stratified shuffle split cross validation
  - (D) Forward chaining cross validation

76. The probability of rejecting the null hypothesis when it is true, is called :
- (A) Level of confidence  
 (B) Level of significance  
 (C) Power of the test  
 (D) All of the above
77. The following are percentages of fat found in 5 samples of each of two brands of food :
- A : 5.7, 4.5, 6.2, 6.3, 7.3  
 B : 6.3, 5.7, 5.9, 6.4, 5.1
- To test the hypothesis of equal average fat content in the two types of food. Which of the following procedures is appropriate ?
- (A) Two sample  $t$ -test with 8 degrees of freedom  
 (B) Paired  $t$ -test with 4 degrees of freedom  
 (C) Two sample  $t$ -test with 9 degrees of freedom  
 (D) Paired  $t$ -test with 5 degrees of freedom
78. The largest population that the resources of a given environment can support is :
- (A) Population structure  
 (B) Carrying capacity  
 (C) Optimum population  
 (D) Minimum population
79. In statistical hypothesis of equality of means such as  $H_0 : \mu = 10$ , if  $\alpha = 5\%$  :
- (A) 95% of the time we will make an incorrect inference  
 (B) 5% of the time we will say that there is no real difference when there is no difference  
 (C) 5% of the time we will say that there is a real difference when there is no difference  
 (D) 95% of the time the null hypothesis will be correct
80. The following system of equations has solution(s) :
- $$x + y = 2$$
- $$6x + 6y = 12$$
- (A) Infinite  
 (B) No  
 (C) Two  
 (D) Unique

81. Tropical cyclones are most frequently observed in the Bay of Bengal during :

- (A) July – August
- (B) Jan. – Feb.
- (C) March – May
- (D) Oct. – Dec.

82. The dispersal of pollutants in air is dependent on :

- (A) Wind speed only
- (B) Wind speed and thermal stability both
- (C) Thermal stability only
- (D) Wind speed and humidity

83. Hydrostatic equation giving the relation between height and pressure at a given temperature :

- (A)  $\frac{dp}{dz} = -\rho T$
- (B)  $\frac{dp}{dz} = \frac{-\rho}{T}$
- (C)  $\frac{dp}{dz} = -\rho g$
- (D)  $\frac{dp}{dz} = \frac{-\rho}{g}$

84. Earth's atmosphere is transparent to infrared radiation in the wavelength band which is called atmospheric window :

- (A) 8 – 13  $\mu$
- (B) 14 – 17  $\mu$
- (C) 7 – 20  $\mu$
- (D) 5 – 7  $\mu$

85. In an area where there are no land surface (open ocean) the albedo of the surface will be :
- (A) Maximum
  - (B) Minimum
  - (C) More than bare soil
  - (D) More than wet soil
86. In an adiabatic process the ..... remains unchanged.
- (A) Temperature
  - (B) Entropy
  - (C) Density
  - (D) Pressure
87. If 10 calories of heat is added to a system which does not change its specific volume, then as per the first law of thermodynamics the change in internal energy of the system will be :
- (A) Zero
  - (B) Positive
  - (C) Negative
  - (D) Either (A) or (C)
88. An inversion layer is seen between 1000 m to 1500 m. If the temperature at 1000 m is 280 K, what will be temperature at the top of the layer (negative lapse rate  $1.0^{\circ}\text{C}/100\text{ m}$ ) ?
- (A) 290 K
  - (B) 278 K
  - (C) 284 K
  - (D) 285 K
89. Subtropical jet stream with its core of strong winds (exceeding 60 kt) at nearly 200 hPa .....
- (A) Moves equatorward in summer
  - (B) Remains at same location in winter and summer
  - (C) Moves equatorward in winter
  - (D) Moves poleward in winter

90. In a dry atmosphere under adiabatic condition the lapse rate is .....
- (A) –  $g/cv$   
(B) –  $g/cp$   
(C) –  $g/cpR$   
(D) –  $gcp/R$
91. Solar constant is :
- (A) 1345 W/M  
(B) 1345 W/M<sup>2</sup>  
(C) 1200 W/M<sup>2</sup>  
(D) 345 W/M
92. If carbon monoxide concentration at 1 atm and 25°C is 9.0 PPMV, then concentration in mg/m<sup>3</sup> is :
- (A) 10.3 mg/m<sup>3</sup>  
(B) 15.2 mg/m<sup>3</sup>  
(C) 20.0 mg/m<sup>3</sup>  
(D) 5.6 mg/m<sup>3</sup>
93. Choose the *correct* concentration for the gases given in List-I generally found in the urban environment :
- List-I : O<sub>3</sub>, CO<sub>2</sub>, CH<sub>4</sub>, CO
- (A) 400 PPMV, 60 PPBV, 1.9 PPMV, 600 PPBV  
(B) 60 PPBV, 400 PPMV, 1.9 PPMV, 600 PPBV  
(C) 1.9 PPMV, 60 PPBV, 400 PPMV, 600 PPBV  
(D) 600 PPBV, 400 PPMV, 40 PPBV, 1.9 PPMV
94. Which one of the following causes warming of the atmosphere but cooling of the Earth's surface ?
- (A) Ozone  
(B) Black carbon aerosols  
(C) All greenhouse gases  
(D) Sulphates and nitrates

95. Which of the following gases facilitates formation of tropospheric ozone in the presence of sunlight ?
- (A)  $\text{SO}_2$
  - (B)  $\text{NO}_2$
  - (C)  $\text{NH}_3$
  - (D)  $\text{SF}_6$
96. Alamatti Dam is on river Krishna and is built in the state :
- (A) Karnatka
  - (B) Maharashtra
  - (C) Andhra Pradesh
  - (D) Telengana
97. What is the source of cloud formation and precipitation in troposphere ?
- (A) Water vapour
  - (B) Rain
  - (C) Infiltration
  - (D) All of them
98. Generally the rain water having pH ..... is considered as acid rain.
- (A) More than 5.6
  - (B) Less than 5.6
  - (C) 10
  - (D) 7
99. Which one is the most abundant greenhouse gas in the atmosphere ?
- (A)  $\text{CH}_4$
  - (B)  $\text{SF}_6$
  - (C)  $\text{N}_2\text{O}$
  - (D)  $\text{CO}_2$
100. Which one of the following is NOT a common component of photochemical smog ?
- (A)  $\text{O}_3$
  - (B)  $\text{SO}_2$
  - (C) PAN
  - (D) CFC's

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