

Signature and Name of Invigilator

1. (Signature) _____
(Name) _____
2. (Signature) _____
(Name) _____

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)

J 8 9 1 5

PAPER - III

Time : 2½ hours]

ENVIRONMENTAL SCIENCE [Maximum Marks : 150

Number of Pages in this Booklet : 16

Number of Questions in this Booklet : 75

Instructions for the Candidates

- Write your roll number in the space provided on the top of this page.
- This paper consists of seventy five multiple choice type of questions.
- 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 :
 - 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 and do not accept an 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 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.
 - After this verification is over, the Test Booklet Number should be entered on the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
- Each item has four alternative responses marked (1), (2), (3) and (4). You have to darken the circle as indicated below on the correct response against each item.
Example : ① ② ● ④ where (3) is the correct response.
- Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only**. If you mark your response 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 in the end of this booklet.
- 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, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.
- 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 original question 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 are no negative marks for incorrect answers.

परीक्षार्थियों के लिए निर्देश

- इस पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए।
- इस प्रश्न पत्र में पचहत्तर बहुविकल्पीय प्रश्न हैं।
- 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 :
 - प्रश्न पुस्तिका खोलने के लिए पुस्तिका पर लगी कागज की सील को फाड़ लें। खुली हुई या बिना स्टीकर सील की पुस्तिका स्वीकार न करें।
 - 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 आपको अतिरिक्त समय दिया जायेगा।
 - इस जाँच के बाद प्रश्न पुस्तिका का नंबर OMR पत्रक पर अंकित करें और OMR पत्रक का नंबर इस प्रश्न पुस्तिका पर अंकित कर दें।
- प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (1), (2), (3) तथा (4) दिये गये हैं। आपको सही उत्तर के वृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है।
उदाहरण : ① ② ● ④ जबकि (3) सही उत्तर है।
- प्रश्नों के उत्तर केवल प्रश्न पुस्तिका 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 चिह्नंकित करते हैं, तो उसका मूल्यांकन नहीं होगा।
- अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें।
- कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें।
- 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, जैसे कि अंकित किये गये उत्तर को मिटाना या सफेद स्याही से बदलना तो परीक्षा के लिये अयोग्य घोषित किये जा सकते हैं।
- 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 मूल प्रश्न पुस्तिका तथा OMR पत्रक की डुप्लीकेट प्रति अपने साथ ले जा सकते हैं।
- केवल नीले/काले बाल प्वाइंट पेन का ही इस्तेमाल करें।
- किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है।
- गलत उत्तरों के लिए कोई नकारात्मक अंक नहीं हैं।

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P.T.O.

ENVIRONMENTAL SCIENCE

PAPER - III

Note : This paper contains **seventy five (75)** objective type questions of **two (2)** marks each. **All** questions are compulsory.

1. Biological zonation in the ocean is determined by :

- (I) Ocean depth
- (II) Light availability
- (III) Bottom substrate

Choose the correct answer :

- (1) (I) only
- (2) (I) and (II) only
- (3) (I), (II) and (III)
- (4) (II) and (III) only

2. Given below are two statements. One labeled as **Assertion (A)** and the other labeled as **Reason (R)** :

Assertion (A) : Methanogenic archae (methanogens) grow in swamps and sewage.

Reason (R) : Methanogens are obligate anaerobes

Choose the correct answer :

- (1) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**.
- (2) Both **(A)** and **(R)** are correct and **(R)** is not the correct explanation of **(A)**.
- (3) **(A)** is true, but **(R)** is false.
- (4) **(A)** is false, but **(R)** is true.

3. Filamentous Cyanobacteria differentiate 5 to 10% of their vegetative cells into heterocysts. Heterocysts are characterized by :

- (I) Thick cell wall
- (II) Only PSI activity
- (III) Nitrogenase activity

Choose the correct answer :

- (1) (I) only
- (2) (I) and (II) only
- (3) (II) and (III) only
- (4) (I), (II) and (III)



4. A critically endangered species :
- (1) Do not exist in wild habitat
 - (2) Face extremely high risk of extinction in immediate future
 - (3) Face high risk of extinction in the medium term future
 - (4) Will not face any risk of extinction in future 1000 years
5. Which of the following characteristics of desert animals are physiological adaptation to conserve water ?
- (I) Thick outer covering
 - (II) Release dry faeces
 - (III) Avoid exposure to direct sunlight
- Choose the correct answer :
- (1) (I) and (III) only
 - (2) (II) and (III) only
 - (3) (I) and (II) only
 - (4) (I), (II) and (III)
6. The balance between photosynthesis and photorespiration is related to :
- (I) The ratio of O_2 and CO_2 in the atmosphere
 - (II) Temperature
 - (III) Kranz anatomy
 - (IV) The ratio of CO_2 and H_2O
- Choose the correct answer :
- (1) (I) and (II) only
 - (2) (II), (III) and (IV) only
 - (3) (I), (II) and (III) only
 - (4) (I), (II), (III) and (IV)
7. Individual organism respond to environmental change through short-term adjustment(s) by :
- | | |
|---------------------------|---|
| (1) Physiological changes | (2) Cytological changes |
| (3) Genetic changes | (4) Phytochemical and genetic alterations |
8. The hurricanes have spatial scale of :
- | | |
|----------------------|--------------------|
| (1) 100 Km - 1000 Km | (2) 10 Km - 100 Km |
| (3) 100 m - 100 Km | (4) 100 m - 10 Km |



9. In SDS - PAGE :
- (1) Polymeric proteins are not only converted into monomers, but monomers are also denatured by SDS.
 - (2) Polymeric proteins converted into monomeric units, but monomers are not denatured.
 - (3) Polymeric proteins are retained as single unit.
 - (4) SDS donot have any negative impact on native structure of monomers.
10. Which of the following is the major source of mercury pollution in India ?
- (1) Coal based thermal power plants
 - (2) Pesticides manufacturing
 - (3) Dental amalgam fillings
 - (4) Electrical and electronic gadgets
11. A non-metal 'X' occurs in nature in free state. It combines with hydrogen to form a gas, which is colourless and highly toxic. Apart from this, 'X' is oxidized to 'XO₂' which is a colourless, pungent and irritating gas. 'X' represents :
- (1) Sulphur
 - (2) Carbon
 - (3) Phosphorus
 - (4) Nitrogen
12. Elemental carbon influences the regional climate because :
- (1) It influences the radiative flux in the atmosphere due to its absorbing properties.
 - (2) It reacts with other pollutants.
 - (3) It coagulates with other atmospheric pollutants.
 - (4) Its concentration is usually more in the atmosphere.
13. Bioremediation of xenobiotics (like melathion) through hydrolysis involves their detoxification by :
- (1) Removal of water
 - (2) Addition of water
 - (3) Both removal and addition of water
 - (4) Removal of phosphate
14. To determine the cation-exchange capacity, it is necessary to calculate the total positive charge associated with ions like :
- (1) Ca²⁺, Mg²⁺, K⁺, Na⁺
 - (2) Ca²⁺, Mn²⁺, Fe³⁺, Cr³⁺
 - (3) Mg²⁺, Fe³⁺, Ni²⁺, Cd²⁺
 - (4) K⁺, BO²⁺, Pb²⁺, Hg²⁺



15. Given below are two statements. One labeled as **Assertion (A)** and the other labeled as **Reason (R)** :

Assertion (A) : Organometals/organometalloids such as trimethylarsine and dimethylmercury are more toxic to living systems (including humans) compared to their inorganic forms.

Reason (R) : Organometals/organometalloids are more hydrophilic than their inorganic forms and hence can move easily across lipid bilayer.

Choose the correct answer :

- (1) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**.
- (2) Both **(A)** and **(R)** are correct and **(R)** is not the correct explanation of **(A)**.
- (3) **(A)** is true, but **(R)** is false.
- (4) **(A)** is false, but **(R)** is true.

16. Project elephant was launched in the year :

- (1) 1973
- (2) 1985
- (3) 1992
- (4) 1998

17. Biological communities in a stream vary based on :

- (I) Water velocity
- (II) Allochthonous material
- (III) Size of the particle on the stream bed
- (IV) Depth of the stream

Choose the correct answer :

- (1) (I) and (II) only
- (2) (I), (II) and (III) only
- (3) (II), (III) and (IV) only
- (4) (I), (II), (III) and (IV)

18. Champion and Seth (1968) classify Indian forests based on :

- (I) Floristic Composition
- (II) Precipitation
- (III) Distance from Sea

Choose the correct answer :

- (1) (I) Only
- (2) (I) and (II) only
- (3) (II) only
- (4) (I), (II) and (III)



19. Which one of the following statements is **not** correct ?
- (1) The solubility of gases varies considerably with pressure.
 - (2) Hydrocarbons chiefly occur in coal, natural gas and petroleum.
 - (3) Polynuclear aromatic hydrocarbons are present in coal tar and fossil fuels.
 - (4) All hydrocarbons are hydrophilic in nature.
20. Gauss exclusion principle states that :
- (1) Complete competitors co-exist
 - (2) Complete competitors cannot co-exist
 - (3) Complete competitors tend to co-operate
 - (4) Symbionts evolve into complete competitors
21. Parasites in a population/community can :
- (I) Influence host population cycles
 - (II) Change ecological communities
 - (III) Change community structure
- Choose the correct answer :
- (1) (I), (II) and (III)
 - (2) (II) and (III) only
 - (3) (III) only
 - (4) (I) only
22. Long - term patterns of evolution are shaped by large scale process(s) such as :
- (I) Speciation
 - (II) Mass extinction
 - (III) Adaptive radiation
- Choose the correct answer:
- (1) (I) only
 - (2) (II) and (III) only
 - (3) (I) and (III) only
 - (4) (I), (II) and (III)
23. Match the **List - I** with **List - II**. Identify the correct answer from the **codes** given below the lists :
- | List - I
(Organism) | List - II
(Interaction) |
|--|--|
| (a) <i>Albugo</i> and Indian mustard | (i) Symbiosis |
| (b) <i>Penicillium</i> and <i>Staphylococcus</i> | (ii) Ammensalism |
| (c) Lichens | (iii) Commensalism |
| (d) Barnacles and whales | (iv) Parasitism |
- Codes :**
- | (a) | (b) | (c) | (d) |
|------------|------------|------------|------------|
| (1) (i) | (ii) | (iii) | (iv) |
| (2) (ii) | (i) | (iv) | (iii) |
| (3) (iv) | (ii) | (i) | (iii) |
| (4) (iv) | (iii) | (ii) | (i) |



24. Extreme of seasonal variation (as much as 80°C swing) from summer to winter is represented by :
- | | |
|----------------------|----------------------|
| (1) Boreal forest | (2) Tropical forests |
| (3) Deciduous forest | (4) Evergreen forest |
25. Aeromycoflora can be trapped and quantified by :
- | | |
|-------------------------|-----------------------------|
| (1) Rotorod air sampler | (2) Anderson air sampler |
| (3) Gregory air sampler | (4) Respirable dust sampler |
26. Which among the following frequencies in microwave region of electromagnetic spectrum is better suited for determination of tree height ?
- | | |
|------------------------------|------------------------------|
| (1) C - band (4 - 8 GHz) | (2) X - band (8 - 12.5 GHz) |
| (3) P - band (0.3 - 1.0 GHz) | (4) K - band (18 - 26.5 GHz) |
27. Which of the common mineral is not a silicate ?
- | | | | |
|------------|-------------|--------------|--------------|
| (1) Quartz | (2) Calcite | (3) Pyroxene | (4) Feldspar |
|------------|-------------|--------------|--------------|
28. Which among the following is the best model in GIS spatial relationships ?
- | | |
|-------------------------------|------------------------|
| (1) Spaghetti model | (2) Topological model |
| (3) Relational database model | (4) Parent-child model |
29. One of the warning signs of an impending volcanic eruption is volcanic tremor, which is :
- | |
|---|
| (1) A change in ground levels |
| (2) Inflation of a volcano as magma rises |
| (3) Ground shaking lasting for minutes or hours |
| (4) Emission of large quantities of gases |
30. Time slot for measuring thermal inertia (TI) differences between land and water is :
- | | | | |
|---------------|---------------|---------------|---------------|
| (1) 1000 hrs. | (2) 1100 hrs. | (3) 1200 hrs. | (4) 1400 hrs. |
|---------------|---------------|---------------|---------------|
31. Slump is a complex slide which consists of :
- | | |
|--------------------------|--------------------------------------|
| (1) Curved shear surface | (2) Curved and planar shear surfaces |
| (3) Planar shear surface | (4) No definite shear surface |
32. In rainwater harvesting, the purpose of percolation tank is :
- | |
|--|
| (1) Recharge groundwater only |
| (2) Surface water supply for irrigation |
| (3) Both surface water supply and groundwater recharge |
| (4) Drinking water supply |



33. Which of the following minerals causes fluoride pollution in the groundwater ?
 (1) Fluorite and Apatite (2) Olivine and Haematite
 (3) Calcite and Magnetite (4) Quartz and Orthoclase
34. Indian monsoon is greatly influenced by :
 (I) Sea surface temperature in pre-monsoon season
 (II) El Nino
 (III) La Nina
 (IV) Depression over Tibet
 Choose the correct answer :
 (1) (I) and (II) only (2) (II) and (III) only
 (3) (III) and (IV) only (4) (IV) only
35. The important continental silicate mineral weathering process of lowering carbon dioxide levels is :
 (1) Hydrolysis (2) Oxidation (3) Carbonation (4) Reduction
36. The set of processes by which soil and rock are loosened and move downhill are called :
 (1) Erosion (2) Saltation (3) Weathering (4) Abrasion
37. Wind mills are most suited for :
 (I) Deserts (II) Offshore
 (III) High altitude (IV) Roof tops
 Choose the correct answer :
 (1) (I) and (II) only (2) (II) and (III) only
 (3) (I) and (III) only (4) (II), (III) and (IV) only
38. Main source of energy for a tropical cyclone formation comes from :
 (I) Heat of condensation of water vapours in the atmosphere
 (II) Torrential rains
 (III) Large ocean waves
 Choose the correct answer :
 (1) (I) only (2) (II) only
 (3) (III) and (II) only (4) (I) and (III) only
39. In the following nuclear fusion reaction ${}^2_1\text{D} + {}^2_1\text{D} = {}^3_2\text{He} + {}^1_0\text{n} + E$ the value of the energy E is :
 (1) 17.6 MeV (2) 18.3 MeV (3) 4.03 MeV (4) 3.27 MeV



40. Fast neutrons produced in nuclear fission reactions involving ^{235}U have average energy of the order of :
- (1) 2 MeV (2) 5 MeV (3) 100 MeV (4) 200 MeV
41. As the population growth rate increases the doubling time :
- (1) Increase (2) Double
(3) Remain constant (4) Decrease
42. A tidal estuary of tidal range 2 m has trapped water area 5000 m². If $g=9.8 \text{ m/s}^2$, the maximum energy available per tidal cycle is :
- (1) 2.45 kW (2) 9.8 kW (3) 98 kW (4) 19.6 kW
43. The power (P) from an ocean wave varies with time period (T) of the wave as :
- (1) $P \propto T$ (2) $P \propto T^2$ (3) $P \propto \frac{1}{T}$ (4) $P \propto \frac{1}{T^2}$
44. With reference to pre-industrial times, the present day average global surface temperature is higher approximately by :
- (1) $\sim 0.56 \text{ }^\circ\text{C}$ (2) $\sim 0.85 \text{ }^\circ\text{C}$ (3) $\sim 1.3 \text{ }^\circ\text{C}$ (4) $\sim 1.5 \text{ }^\circ\text{C}$
45. Burning of 1 mol of CH_4 liberates 890 kJ of energy and 1 mol of CO_2 . Since 1 mol of CO_2 has 12 g of carbon, the higher heating value (HHV) of methane is :
- (1) 13.5 gC/MJ (2) 18.5 gC/MJ (3) 12.0 gC/MJ (4) 10.0 gC/MJ
46. pH of 1 mM HCl is :
- (1) 1 (2) 2 (3) 3 (4) 11
47. Priority air pollutants included in the air quality index for urban areas in India are :
- (1) CO , NO_x , PM_{10} and $\text{PM}_{2.5}$, SO_x , O_3 , ammonia and Pb
(2) CO , NO_x , SO_x and Pb
(3) NO_x , SO_x , O_3 and Pb
(4) PM_{10} and $\text{PM}_{2.5}$, NO_x , SO_x , O_3 and Pb
48. Present day advanced anaerobic digestors can generate power in the range :
- (1) 2 - 10 MW (2) 20 - 100 MW (3) 100 - 200 MW (4) 200 - 500 MW
49. Cement dust is characterized by very fine particulates. Which of the following air pollution control devices is appropriate for removing them from hot exhaust gases emanating from cement kiln ?
- (1) Baghouse (2) Cyclones
(3) Venturi scrubber (4) Electrostatic precipitator



50. The sources of aliphatic hydrocarbons in indoor environment are :
- (1) Paints, adhesives and gasoline (2) Aerosol sprays and solvents
 (3) Spirits and cleansers (4) Solvents and vinyl flooring
51. Given the following data of sound pressure levels measured at equal intervals: 60 dB, 62 dB, 63 dB, 59 dB, 60 dB, 80 dB, 58 dB, 59 dB, 65 dB, 57 dB, 62 dB. The value of the background noise level (L_{90}) is :
- (1) 62.5 dB (2) 57 dB (3) 61 dB (4) 58 dB
52. The air-to-fuel ratio (A/F) for complete combustion in an internal combustion engine is about :
- (1) 14.6 (2) 11.2 (3) 12.1 (4) 15.5
53. Phytovolatalization of mercuric pollutants involves volatalization of mercury in :
- (1) Elemental state (2) Ionic state
 (3) Organic state (4) Both ionic and organic state
54. Match the **List - I** with **List - II**. Identify the **correct** answer from the **codes** given below the lists :
- | List - I | List - II |
|------------------|----------------------------|
| (a) Texture | (i) Vertical zonation |
| (b) Profile | (ii) Land degradation |
| (c) Erosion | (iii) Planting tree |
| (d) Conservation | (iv) Mineral particle size |
- Codes :**
- | (a) | (b) | (c) | (d) |
|------------|------------|------------|------------|
| (1) (iv) | (i) | (ii) | (iii) |
| (2) (i) | (ii) | (iii) | (iv) |
| (3) (ii) | (iii) | (iv) | (i) |
| (4) (iii) | (iv) | (i) | (ii) |
55. Environmental Management Plan is associated with :
- (1) EIS (2) Environmental audit
 (3) ISO 14000 (4) LCA
56. ISO 14000 is connected with :
- (1) Adoption of environmental safety guideline
 (2) Energy audit in Industries
 (3) Adoption of clean development
 (4) Adoption of environmental management system in industry/organisation



57. CAPART in India stands for :
- (1) Committee for Advancement and Promotion of Rural Technology
 - (2) Council for Advancement of Rural Technology
 - (3) Council for Advancement of People's Action and Rural Technology
 - (4) Committee for Advancement and Privatization of Rural Technology
58. EIA of Port and Harbour projects involve impact assessment on :
- (I) Biological environment
 - (II) Air environment
 - (III) Soil environment
 - (IV) Social environment
- Choose the correct answer :
- (1) (I) only
 - (2) (II) only
 - (3) (III) only
 - (4) (I), (II) and (IV) only
59. Which act provided provisions for enforcing levy and collection of a tax on water consumed by industries ?
- (1) Water (prevention and control of pollution) Act 1974
 - (2) Water (prevention and control of pollution) Cess Act 1977
 - (3) Environment (protection) Act 1986
 - (4) Public Liability Insurance Act 1991
60. Disaster risk reduction in degraded wilderness areas is better achieved using :
- (1) People's participation
 - (2) Ecosystem based management
 - (3) Strengthening of people's economic conditions
 - (4) Afforestation
61. The major conventions of Rio Earth Summit are :
- (1) CBD and climate change
 - (2) Kyoto protocol and Montreal protocol
 - (3) CDM and Nagoya protocol
 - (4) Basel convention and Bameco convention
62. If $\gamma_s < \gamma_e < \gamma_d$ where γ_s , γ_e and γ_d are saturated adiabatic lapse rate, environmental lapse rate and dry adiabatic lapse rate, the atmosphere is :
- (1) Stable
 - (2) Conditionally unstable
 - (3) Unstable
 - (4) Neutral



63. Match the **List - I** with **List - II**. Identify the **correct** answer from the **codes** given below the lists :

List - I
(Tests)

- (a) Z - test
- (b) t - test
- (c) Chi - square (χ^2) test
- (d) F - test

List - II
(Application)

- (i) Judging the significance of differences between means of two small samples
- (ii) Judging the significance of mean, median, mode
- (iii) Compare the variance of two - independent samples
- (iv) Compare sample variance to a theoretical population variance

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-------|-------|-------|-------|
| (1) | (ii) | (i) | (iv) | (iii) |
| (2) | (iii) | (ii) | (i) | (iv) |
| (3) | (iv) | (iii) | (ii) | (i) |
| (4) | (i) | (iv) | (iii) | (ii) |

64. Chocolates of 250 g produced in a factory were observed to have standard deviation of 2 g. A random sample of 20 chocolates showed a standard deviation of 1.5 g. What is the χ^2 value for the sample ?

- (1) 7.2 (2) 6.0 (3) 12.0 (4) 33.3

65. Which one of the following would indicate that a dataset is **NOT** distributed in a bell - shape ?

- (1) The range is equal to 5 standard deviation
- (2) The range is larger than the inter quartile range
- (3) The mean is much smaller than the median
- (4) There are no outliers

66. In a random sample of $n = 16$, the mean (\bar{X}) is 40, and the standard deviation (sd) is 4.0. The 95% confidence interval ($Z = 1.96$) for the mean is :

- (1) ± 4.0 (2) ± 1.96 (3) ± 0.25 (4) ± 0.30

67. The title of the Brundtland report is :

- (1) Caring for Earth
- (2) Caring of Biosphere
- (3) Our Common Future
- (4) The Silent Spring



68. According to Gaussian Plume Model, the maximum ground level concentration (C) varies with height (H) of chimney :

- (1) $C \propto \frac{1}{H}$ (2) $C \propto H^{-2}$ (3) $C \propto H^{-1/2}$ (4) $C \propto H^{-3/2}$

69. Given below are two statements. One labeled as **Assertion (A)** and the other labeled as **Reason (R)** :

Assertion (A) : A wetland of international importance is brought under the 'Montreux Record'.

Reason (R) : The country in which the wetland is located should enact a law to prohibit any human activity within five kilometers from the edge of the wetland.

Choose the **correct** answer :

- (1) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(2) Both (A) and (R) are correct and (R) is not the correct explanation of (A).
(3) (A) is true, but (R) is false.
(4) (A) is false, but (R) is true.

70. Which of the following methods related to fly ash utilization has future ecofriendly and economic benefits ?

- (I) Direct application to cropland
(II) Converting to Bricks
(III) Using as a road-sub-base material

Codes :

- (1) (I) and (II) only
(2) (II) and (III) only
(3) (I) and (III) only
(4) (I), (II) and (III)

71. Which of the following is **NOT** one of the twelve principles of green chemistry ?

- (1) Minimize or eliminate the need for waste cleanup by emphasizing waste prevention
(2) Minimize energy consumption
(3) Maximize use of products from green plants
(4) Avoid the use and generation of hazardous substances that may harm humans or the environment



72. Match the **List - I** with **List -II**. Identify the **correct** answer from the **codes** given below the lists :

List - I		List - II	
(Halocarbons)		(Atmospheric residence time)	
(a) CF_4	(i) ~ 50 years		
(b) CF_2Cl_2	(ii) $\sim 50,000$ years		
(c) CFCl_3	(iii) ~ 65 years		
(d) CF_3Br	(iv) ~ 102 years		

Codes :

	(a)	(b)	(c)	(d)
(1)	(ii)	(iv)	(i)	(iii)
(2)	(iii)	(i)	(ii)	(iv)
(3)	(iv)	(ii)	(iii)	(i)
(4)	(i)	(iii)	(iv)	(ii)

73. Climate change has become a buzz word throughout the world. In case of the Himalayas the best way to infer whether there is a climate change or not is to :

- (I) Monitor tree line
- (II) Monitor migration of glaciers
- (III) Study alteration in species composition

Choose the **correct** answer :

- (1) (I) only
- (2) (I) and (II) only
- (3) (II) only
- (4) (I), (II) and (III)

74. Landslide hazards in the Himalayan region are the consequence of :

- (I) Road cutting
- (II) Seismic activity
- (III) Deforestation
- (IV) Urbanization

Choose the **correct** answer :

- (1) (I) only
- (2) (I) and (II) only
- (3) (I), (II) and (III) only
- (4) (I), (II), (III) and (IV)



75. Consider the following International agreements.

- (I) The International Treaty on Plant Genetic Resources for Food and Agriculture
- (II) The United Nations Convention to Combat Desertification
- (III) The World Heritage Convention

Which of the above has/have a bearing on the biodiversity ?

Choose the **correct** answer :

- (1) (I) and (II) only
- (2) (III) only
- (3) (I) and (III) only
- (4) (I), (II) and (III)

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Space For Rough Work

