### Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.

2. Answer to short answer/essay type questions are to be given in the space provided below each question or after the questions in the Test Booklet itself.

   **No Additional Sheets are to be used.**

3. 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:
   
   - (i) 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.
   
   - (ii) 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.

4. Read instructions given inside carefully.

5. One page is attached for Rough Work at the end of the booklet before the Evaluation Sheet.

6. If you write your Name, Roll Number, Phone Number or put any mark on any part of the Answer 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.

7. You have to return the test booklet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall.

8. **Use only Blue/Black Ball point pen.**

9. Use of any calculator or log table etc., is prohibited.
Note: This paper is of two hundred (200) marks containing four (4) sections. Candidates are required to attempt the questions contained in these sections according to the detailed instructions given therein.

Answer to all questions must be written in English only.
SECTION – I

Note: This section consists of two essay type questions of twenty (20) marks each, to be answered in about five hundred (500) words each. (2 × 20 = 40 Marks)

1. Write an essay on:

Principle and Applications of chromatography in environmental science.
OR
Conservation of wetlands.
OR
Bio-Energy.
OR
Methodologies of Environmental Impact Assessment.
OR
Multiple regression technique and its application in environmental data analysis.
OR
Applications of GIS and Remote Sensing in water resource management.
2. **Write an essay on:**

   Sources and effects of unsaturated and saturated hydrocarbons in the atmosphere.
   **OR**
   Environmental Ethics and Global imperatives.
   **OR**
   Recent trends in Biodiversity conservation.
   **OR**
   Pros and cons of Genetically modified plants.
   **OR**
   Jurisdiction and powers of National Environmental Appellate Authority.
   **OR**
   Role of soil microorganisms.
SECTION – II

Note: This section contains three (3) questions of fifteen (15) marks each, to be answered in about three hundred (300) words. (3 × 15 = 45 Marks)

3. Discuss the criteria employed for dispersal of pollutants in marine ecosystems.

4. Discuss ‘Nitrogen Cycle’ and its significance.

5. Describe the operation of an effluent treatment plant.
SECTION – III

Note: This section contains nine (9) questions of ten (10) marks each, to be answered in about fifty (50) words. (9 × 10 = 90 Marks)

6. Define aerodynamic diameter of an aerosol particle. How do the aerosol particles influence climate?

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7. Define phytoremediation. With suitable examples distinguish between phytoextraction and phytostabilization.

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8. The molar extinction coefficient of X-iodine complex at 450 nm is 0.2. Determine the concentration of X in a solution of the iodine complex which has an absorbance of 0.38 in a 1 cm cuvette.
10. Distinguish between El Nino and La Nina effects.

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12. Explain the terms “precipitation” and “water table”.
13. Differentiate between adiabatic lapse rate and environmental lapse rate.
14. Compare “Pyramid of numbers” for pond and tree ecosystems.

SECTION – IV

Note: This section contains five (5) questions of five (5) marks each based on the following passage. Each question should be answered in about thirty (30) words.

(5 x 5 = 25 Marks)

Some years ago, the Arogya Health Service sent supplier of DDT to Karkala to control mosquitoes that were spreading malaria among the people. As the DDT was sprayed, the mosquitoes were quickly wiped out. But there were thousands of lizards in the village that ate these mosquitoes (which had absorbed the sprayed DDT) and
they, in turn, kept accumulating the DDT in their bodies. When these lizards ate mosquitoes, they retained a lot of the DDT in their body. Due to the excessive accumulation of DDT in their bodies, the lizards became inactive and slow. This made it easier for cats to catch the lizards, one of their favourite food. At about the same time, people also found hordes of caterpillars on the roofing materials of their homes. They realised that the lizards, which had previously kept the caterpillar population under control, were now being eaten by the cats. And now, all over Karkala, the cats that ate the lizards died from DDT poisoning. Then rats moved in because there were no cats to control their population. With the rats came a new danger, plague. Officials sent out emergency calls for cats, which were sent in by Aeroplane and dropped by Parachute.

15. How did one small act of humans (spraying of DDT) disturb the balance of the ecosystem?
16. How did absence of mosquitoes affect outburst of plague?

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17. How did roofing material get spoiled in Karkala?

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18. How did cats that ate the lizards die?

19. What inference you draw from the above passage?
Space For Rough Work
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Total Marks Obtained (in words) ...........................................
(in figures) ..........................................
Signature & Name of the Coordinator .......................................
(Evaluation) Date ..........................