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.

J-89-11

Number of Pages in this Booklet : 32
Number of Questions in this Booklet : 19

[Maximum Marks : 200]
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.
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. Hazardous waste management.
   OR
   Problems and prospects of nuclear energy in India.
   OR
   Soil types in India
   OR
   Role of National Parks and Sanctuaries in conservation of biodiversity.
   OR
   Environmental Impact Assessment of open cast coal mining projects.
   OR
   Environmental dimensions of pesticides and biopesticides.
2. Marine pollution as an emerging problem in India.
   OR
   Seismic zonation and earthquake risks in India.
   OR
   Bioethanol production from plant biomass.
   OR
   Principle of Atomic Absorption Spectroscopy and its application in the study of Environmental samples.
   OR
   Wildlife Conservation and Management.
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. The excessive application of nitrogen fertilizers contaminates the groundwater. Comment.

4. Describe various types of radioactive waste.

5. Discuss the role of ions and radicals in the atmospheric chemistry.
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. What is the significance of carbonate compensation depth and lysocline in marine environment?

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7. How do the benthic fauna contribute to the productivity of a water body?

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8. Write about the methods to test the microbial quality of drinking water.
9. Define aquifer and zone saturation in relation to ground water.
10. Enlist methods for control of NO$_x$ pollution in environment.

11. Distinguish between actinomycetes from fungi.
12. Define day-night noise index $L_{DN}$, if day is of 15 hours (6 AM – 9 PM) and night is of 9 hours (9 PM – 6 AM).
13. What are the guidelines of environmental audit?
14. Give in brief the theoretical framework of a multiple regression model.

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.

\[(5 \times 5 = 25 \text{ marks})\]

Since long it has been realised that the exploitation of fossil fuels, metals and other non-renewables cannot continue unchecked. Expression of worldwide concern about sustainable industrialisation and development led to the first UN Earth Summit in Rio de Janeiro in 1992. The Summit defined the objectives of the sustainable
development which included avoiding depletion of non–renewable resources, protection of environment, social equity and justice.

The International Energy Agency in the year 2003 predicted that with increasing energy demand, the world’s supply of crude oil will peak around 2014 and that coal will last until the year 2200. The decline in available coal and crude oil should cause their prices to go up which would limit their use. Moreover the use of fossil fuels has been identified as a major factor contributing to global warming. To address the problems due to global warming, the international community agreed to have Kyoto Protocol in 1997, which envisaged a reduction of CO$_2$ emissions by 5.2% below 1990 levels by 2012. The use of renewable energy was to be increased to 5% by 2003 and 10% by 2010.

The Governments in United Kingdom and India have also stressed the need to create a low carbon economy and to have a low carbon footprint for the individuals. In response, countries like India have started searching for alternative energy sources. In this quest for developing new sources of energy, Biotechnology can play a significant role by identifying biological agents, tools and techniques for producing biofuels. This would help in achieving the goal of energy security for the country to a great extent.

15. What are the main objectives of sustainable development ?
16. What is the major cause of global warming and how does it occur?

17. What was the main resolution of Kyoto Protocol?
18. What do you understand by low carbon economy and carbon footprint?
19. How can biotechnology help in achieving energy security?
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Total Marks Obtained (in words) ..............................................

(in figures) ..........................................

Signature & Name of the Coordinator ...............................

(Evaluation) Date ...............................................

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