Signature and Name of Invigilator

1. (Signature) _____

   (Name) _____

2. (Signature) _____

   (Name) _____

Roll No. | | | | | | | | |

(In figures as per admission card)

Roll No. _____

(In words)

Test Booklet No.

D—8905

PAPER—III

ENVIRONMENTAL SCIENCE

Time : 2½ hours] **[Maximum Marks : 200**

Number of Pages in this Booklet : **32** Number of Questions in this Booklet : **26**

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. Answers 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 Test 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 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, 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.**
10. **There is NO negative marking.**

परीक्षार्थियों के लिए निर्देश

1. पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए।
2. लघु प्रश्न तथा निबंध प्रकार के प्रश्नों के उत्तर, प्रत्येक प्रश्न के नीचे या प्रश्नों के बाद में दिये हुये रिक्त स्थान पर ही लिखिये।

   इसके लिए कोई अतिरिक्त कागज का उपयोग नहीं करना है।
3. 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 :
   (i) प्रश्न-पुस्तिका खोलने के लिए उसके कवर पेज पर लगी सील को फाड़ लें। खुली हुई या बिना स्टीकर-सील की पुस्तिका स्वीकार न करें।
   (ii) **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 अर्थात किसी भी प्रकार की त्रुटिपूर्ण पुस्तिका स्वीकार न करें तथा उसी समय उसे लौटाकर उसके स्थान पर दूसरी सही प्रश्न-पुस्तिका ले ले। 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।**
4. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें।
5. उत्तर-पुस्तिका के अन्त में कच्चा काम (Rough Work) करने के लिए मूल्यांकन शीट से पहले एक पृष्ठ दिया हुआ है।
6. यदि आप उत्तर-पुस्तिका पर अपना नाम या ऐसा कोई भी निशान जिससे आपकी पहचान हो सके, किसी भी भाग पर दर्शाते या अंकित करते हैं तो परीक्षा के लिये अयोग्य घोषित कर दिये जायेंगे।
7. आपको परीक्षा समाप्त होने पर उत्तर-पुस्तिका निरीक्षक महोदय को लौटाना आवश्यक है और इसे परीक्षा समाप्ति के बाद अपने साथ परीक्षा भवन से बाहर न लेकर जायें।
8. **केवल नीले / काले बाल प्वाईंट पैन का ही इस्तेमाल करें।**
9. **किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है।**
10. **गलत उत्तर के लिए अंक नहीं काटे जायेंगे।**

ENVIRONMENTAL SCIENCE

PAPER – III

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 contains five (5) questions based on the following paragraph. Each question should be answered in about thirty (30) words and each carries five (5) marks.

(5x5=25 marks)

Read the passage given below and answer the questions that follow based on your understanding on the passage :

An important mechanism in global climate is that of oceans. Covering some 70% of the planet, the oceans act as a gigantic fly wheel in the earth's machinery. As a huge reservoir of carbon, the oceans regulate the atmospheric CO_2 level and hence global climate Ocean Currents also play a major role in setting long term climate patterns. The Gulf Stream is part of a huge oceanic "Conveyer Belt" current, containing 20 times as much water as all the worlds rivers, that carries heat from the Atlantic to Pacific and from pole to equator. A small scale current switch is the well-known "El Nino". "El Nino" is a phenomena which occurs from December to March when the waters of the eastern Pacific warms up a little (28°C ie 4°C higher than normal) and disrupts the upwelling of the rich, cold water. When El Nino occurs, trade winds weaken and change the direction from west to east. Warm Pacific current flows eastwards and warms the air, which lowers the atmospheric pressure. This has tele connections over the whole globe and affects Indian Monsoon. It is also believed to cause weather disturbances around the world leading to monsoons in Tahiti, drought in Africa and Australia etc. This may have unforeseen consequences for the flora and fauna of Indian and Pacific Ocean region.

1. Give any five environmental issues of El Nino.

2. How do the oceans regulate the atmospheric CO_2 level ?

3. Why does the sea water remain saline despite the influx of fresh water ?

4. Explain the role of Gulf Stream in influencing the climate over North Atlantic.

5. "El Nino would have unforeseen consequences for the flora and fauna". Comment.

SECTION - II

Note : This section contains fifteen (15) questions each to be answered in about thirty (30) words. Each question carries five (5) marks.

(5x15=75 marks)

6. Define gene pool.

7. What is meant by steady-state non-conservative system ?

8. Define ecological succession.

9. Explain the nature of the interior of the earth.

10. What is meant by wind rose ?

11. Define steam reformation of hydrocarbons.

12. Define and distinguish between BOD and COD.

13. Explain the cation-exchange capacity in clays.

14. Define correlation coefficient and state its significance in statistical data analysis.

15. What is meant by cost-effective analysis ?

16. Giving the chemical equations, define pH and Eh of carbonate systems.

17. Explain the principle of anaerobic digestion in a biogas plant.

18. Define the principle of Ocean Thermal Energy Conversion (OTEC).

19. Explain the index of equivalent sound pressure level.

20. Enumerate the characteristics of a soil profile in a temperate region.

SECTION - III

Note : This section contains five (5) questions. Each question carries twelve (12) marks and is to be answered in about two hundred (200) words.

(12x5=60 marks)

21. How does the temporal and spatial distribution of precipitation occurs during the monsoon ?

22. Discuss the ecological issues related to mega hydel projects and associated rehabilitation.

23. Give an account on the pesticides and their toxicity.

24. Explain the mechanism of radioactive forcing by black carbon particles in the atmosphere.

25. Explain the principle and applications of Gaussian Plume model.

SECTION - IV

Note : This section consists of one essay type question of forty (40) marks to be answered in about one thousand (1000) words on any of the following topics.

(40x1=40 marks)

26. Discuss the structure and composition of the atmosphere. Comment on the stability of atmosphere.

OR

Discuss the principle, method and applications of atomic absorption spectrophotometry.

OR

Write an essay on the structure and dynamics of an ecosystem.

OR

Discuss the thermochemical and photochemical reactions in the troposphere with a special emphasis on photochemical smog and acid rain.

OR

Write an essay on the importance of minerals in modern industrial society.

OR

Enumerate the various types of natural hazards. Discuss the causative factors and effects of the one prevailing in Himalayan region.

OR

Explain the characteristics of waste lands. Add a note on their reclamation methods.

OR

Write an essay on the potential of renewable energy sources in the Indian Context.

OR

Write an essay on the applications of remote sensing and GIS in the evaluation of natural resources and their management.

FOR OFFICE USE ONLY							
Marks Obtained							
Question Number	Marks Obtained	Question Number	Marks Obtained	Question Number	Marks Obtained	Question Number	Marks Obtained
1		26		51		76	
2		27		52		77	
3		28		53		78	
4		29		54		79	
5		30		55		80	
6		31		56		81	
7		32		57		82	
8		33		58		83	
9		34		59		84	
10		35		60		85	
11		36		61		86	
12		37		62		87	
13		38		63		88	
14		39		64		89	
15		40		65		90	
16		41		66		91	
17		42		67		92	
18		43		68		93	
19		44		69		94	
20		45		70		95	
21		46		71		96	
22		47		72		97	
23		48		73		98	
24		49		74		99	
25		50		75		100	

Total Marks Obtained (in words) .....

(in figures) .....

Signature & Name of the Coordinator .....

(Evaluation) Date .....