

## UGC NET Paper 3 December 26, 2010 Shift 1 Environmental Sciences Question Paper

**PAPER-III**  
**ENVIRONMENTAL SCIENCES**

**Signature and Name of Invigilator**

1. (Signature) \_\_\_\_\_  
(Name) \_\_\_\_\_
2. (Signature) \_\_\_\_\_  
(Name) \_\_\_\_\_

Roll No. 

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(In figures as per admission card)

Roll No. \_\_\_\_\_  
(In words)

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Time : 2 1/2 hours]

[Maximum Marks : 200

Number of Pages in this Booklet : 32

Number of Questions in this Booklet : 19

**Instructions for the Candidates**

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

- 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.**

- Read instructions given inside carefully.
- One page is attached for Rough Work at the end of the booklet before the Evaluation Sheet.
- 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.
- 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.
- Use only Blue/Black Ball point pen.**
- Use of any calculator or log table etc., is prohibited.**

**परीक्षार्थियों के लिए निर्देश**

- पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए ।
- लघु प्रश्न तथा निबंध प्रकार के प्रश्नों के उत्तर, प्रत्येक प्रश्न के नीचे या प्रश्नों के बाद में दिये हुए रिक्त स्थान पर ही लिखिये ।  
इसके लिए कोई अतिरिक्त कागज का उपयोग नहीं करना है ।
- 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 कागज की 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 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 ।
- अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें ।
- उत्तर-पुस्तिका के अन्त में कच्चा काम (Rough Work) करने के लिए मूल्यांकन शीट से पहले एक पृष्ठ दिया हुआ है ।
- 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 ।
- 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 ।
- केवल नीले/काले बाल प्वाइंट पेन का ही इस्तेमाल करें ।
- किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है ।

**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 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.      Municipal solid waste management.

**OR**

Environmental problems associated with megathermal power plants.

**OR**

Ground water provinces of India.

**OR**

Agro-climatic regions of India.

**OR**

Biodiversity and climate change.

**OR**

Biodegradation of plant biomass.







2. Wetland Conservation.
- OR
- Clean Development Mechanism (CDM) and Environmental protection.
- OR
- The types, sources and consequences of water pollution.
- OR
- Soil bioremediation – An emerging technology.
- OR
- An ecosystem, its structure and functions.
- OR
- Environmental Impacts of thermochemical and photochemical reactions in atmosphere.







**SECTION – II**

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

3. Describe the effects of Cd, Hg and As contamination on soil health.
4. How does an electrostatic precipitator (ESP) remove particles from flue gases ? On what factors the efficiency of ESP depends ?
5. Write about the constitutional provisions pertaining to environment.

















**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 redox potential ? Discuss its significance.

7. Write about chemical reactions leading to ozone depletion.

8. Differentiate between autochthonous and an allochthonous bacteria.

9.      What are the essential components of a rain water harvesting system ?

10. Define mixing height. Explain its significance in dispersal of air pollutants.

11. What are five-R policies for waste minimization ?

12. What is meant by a ‘genetically engineered’ bacterium ? How is this accomplished ?

13. How does a solar photovoltaic (PV) cell work ? On what factors its efficiency depends ?

- Prepp  
Your Personal Exam Guide

**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.

Around 1960, Lake Erie was declared dead, its DO decreased in deeper layer of water, its surface almost covered by overgrowth of algae, and some of its predators became

endangered. Investigations were carried out by many scientists, who concluded that the major cause of the destruction of the Lake Erie ecosystem was too much phosphorous from municipal waste. In order to overcome the problems of Lake Erie, it was thought that there should be a strong cooperation between USA and Canada. The International Joint Commission was established and the governments of the two countries worked together for improving waste treatment in communities surrounding Lake Erie. By 1985, the annual release of phosphorous from these sources reduced by 84% and the phosphorus levels in the Detroit River, which feeds Lake Erie, was reduced by 65%. As the water quality improved with phosphorous abatement, algal growth declined and oxygen levels improved. The small planktonic crustaceans that feed on the algae became less abundant and fishes, such as undesirable alewife and shiner, that feed on them, also decreased. By 1991, the total phosphorous level in Lake Erie was reduced to a level very close to the permissible level. The decline in algal population resulted in the improvement of water clarity in the Lake. Moreover, the decline in algal population has also been achieved by invading zebra mussels in Lake Erie.

Answer the following questions :

15. How does phosphorous enrichment of water body cause algal growth ?

16. How did the process of eutrophication in Lake Erie lead to oxygen depletion ?

17. How the invasion of zebra mussels will affect the ecology of Lake Erie ?

18. What was the institutional mechanism set up to address the problems of Lake Erie ?

Prepp  
al Exam Guide

**Space For Rough Work**



| FOR OFFICE USE ONLY |                |
|---------------------|----------------|
| Marks Obtained      |                |
| Question Number     | Marks Obtained |
| 1                   |                |
| 2                   |                |
| 3                   |                |
| 4                   |                |
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| 6                   |                |
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| 13                  |                |
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| 16                  |                |
| 17                  |                |
| 18                  |                |
| 19                  |                |

Total Marks Obtained (in words) .....  
(in figures) .....  
Signature & Name of the Coordinator .....  
(Evaluation) Date .....