P R E F A C E

Welcome to the **CUET PG Environmental Science Book**, a comprehensive resource for your preparation for the **Common University Entrance Test (CUET) for Postgraduate Programs** in Environmental Science. This book includes **Previous Years' Questions (2022-2024)**, **Three Mock Tests**, and **detailed solutions**, all organized by topic to help you build a strong foundation and prepare strategically.

Key Features:

- **Previous Years' Questions (2022-2024)**: A collection of PYQs with **detailed solutions** to help you understand the exam pattern and approach.
- **Three Mock Tests**: Simulate real exam conditions with mock tests covering a wide range of topics, accompanied by **step-by-step solutions**.
- **Topic-wise Organization**: Questions sorted by topic to focus on specific areas, making your revision efficient and targeted.
- **Conceptual Clarity**: Each solution explains the reasoning, enhancing your understanding and retention of key concepts.

This book is designed to improve your **problem-solving skills**, **time management**, and **confidence**, ensuring thorough preparation for the CUET PG Environmental Science exam.

A C K N O W L E D G E M E N T

First and foremost, I'd like to thank our entire Institute for Advanced Studies (IFAS) students for inspiring me to write this book. I would like to express my gratitude to Er. Radheshyam Choudhary, founding CEO of IfAS Edutech Pvt. Ltd. and Director of IFAS Publications, for his invaluable assistance and critical suggestions in completing the work.

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About Common University Entrance Test CUET PG

Common University Entrance Test (CUET) is being introduced for admission into PG programmes in Central and participating Universities for academic sessions. The Common University Entrance Test (CUET) will provide a common platform and equal opportunities to candidates across the country, especially those from North- East and from rural and other remote areas and help to establish better connections with the Universities. A single Examination will enable the Candidates to cover a wide outreach and be part of the admissions process to various Central Universities.

The CUET PG will be conducted in CBT mode in 02 shifts for admissions in the next academic Session.

Eligibility and Qualifications

Age Limit

For appearing in the CUET (PG), there is no age limit for the candidates.

As the eligibility criteria for admission may be unique for every University, the candidates are advised to visit the University website to which they are applying for their respective programs.

Candidates are advised to satisfy themselves before applying that they possess the eligibility

CUET PG Exam Pattern

Particulars	Details
Mode of exam	Computer-based test (CBT)
Time Duration	105 minutes
Type of Questions	Multiple Choice Questions (MCQs)
Total Number of paper codes	4
Number of Questions	75
Total Marks	300

Marking Scheme

- Each question carries **04 (four) marks**.
- For each correct response, the candidate will get 04 (four) marks.
- For each **incorrect response, 01 (one) mark will be deducted** from the total score.
- Un-answered/un-attempted response will be given no marks.
- To answer a question, the candidate needs to choose one option as the correct option.
- However, after the process of Challenges of the Answer Key, in case there are multiple correct options or change in key, only those candidates who have attempted it correctly as per the revised Final Answer Key will be awarded marks.
- In case a Question is dropped due to some technical error, full marks shall be given to all the candidates irrespective of the fact who have attempted it or not. *Examination will be conducted on multiple days in two shifts per day schedule and date sheet will be available on the website. Keep viewing it for updates.

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CHAPTER 1

EARTH SCIENCES

Unit 1.1: Structure and Composition of Environment- Atmosphere, Hydrosphere and Lithosphere, Earth Processes, Mineral and Power Resources in India

[Previous Year Exam Questions]

[Sep 2022]

1. The sky looks blue because of:
(1) Rayleigh scattering (2) Miscattering
(3) Diffraction (4) Polarisation

[Sep 2022]

2. All the weather/meteorological processes take place in-
(1) Thermosphere (2) Troposphere
(3) Stratosphere (4) Mesosphere

[Sep 2022]

3. In the troposphere, temperature.....with altitude while in stratosphere, temperature.....with altitude.z
(1) Increases, decreases
(2) decreases, increases
(3) Remains constant, increases
(4) Increases, remains constant

[Sep 2022]

4. Richter scale is a/an_____scale to measure Earth Tremors.
(1) Exponential (2) Logarithmic
(3) Geometric (4) Physical

[Sep 2022]

5. More than 90% of the rock forming minerals in the Earth's crust consist of:
(1) Silicates
(2) Oxides
(3) Carbonates
(4) Sulphides and Sulphates

[Sep 2022]

6. Which form of soil water is most available to the plants?
(1) Hygroscopic water (2) Capillary water
(3) Gravitational water (4) Water vapour

[Sep 2022]

7. Which source has the highest installed power generation capacity (MW) in India?
(1) Thermal Power (2) Hydro Power
(3) Nuclear Power (4) Renewable Energy

[Sep 2022]

8. What is tropopause height in the equatorial regions and in the high latitude regions?
(1) $\sim 18\ kms\ and \sim 10\ kms$
(2) $\sim 10\ kms\ and \sim 18\ kms$
(3) $\sim 12\ kms\ and \sim 12\ km$
(4) $\sim 8\ kms\ and \sim 18\ kms$

[Sep 2022]

9. The thickness of Ozone layer is measured in which of the following units?
(1) Metres (2) Centimetres
(3) Dobson Units (4) Decibel Units

[Sep 2022]

10. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: Denitrification is an undesirable process from agricultural point of view.
Reason R: Here the nitrate present in soil is converted to nitrogen gas and it is lost to the atmosphere.
In the light of the above statements, choose the correct answer from the options given below:
(1) Both A and R are true and R is the correct explanation of A
(2) Both A and R are true but R is NOT the correct explanation of A
(3) A is true but R is false
(4) A is false but R is true

[Sep 2022]

11. Arrange the following layers of atmosphere in the sequence of increasing altitude from the earth's surface.
(A) Planetary Boundary layer
(B) free troposphere
(C) Tropopause
(D) Mesosphere

(E) Stratosphere

Choose the correct answer from the options given below:

(1) B, C, D, E, A (2) A, B, C, D, E

(3) A, B, C, E, (4) B, C, E, D, A

[Sep 2022]

12. Arrange the following layers of the earth starting from the centre of the earth till surface of the earth.

(A) Lithosphere

(B) Inner Core

(C) Mantle

(D) Outer Core

(E) Asthenosphere

Choose the correct answer from the options given below:

(1) A, B, C, D, E (2) B, D, C, E, A

(3) B, E, C, D, A (4) B, E, D, C, A

[Sep 2022]

13. Given below are two statements:

Statement I: Ocean is not considered to be an important carbon reservoir in the Earth system.

Statement II: CO_2 residence time in ocean is higher than atmosphere.

(1) Both Statement I and Statement II are true

(2) Both Statement I and Statement II are false

(3) Statement I is true but Statement II is false

(4) Statement I is false but Statement II is true

[Sep 2022]

14. Match List I with List II

LIST I	LIST II
A. Atmosphere	I. Outer crust of the Earth
B. Hydrosphere	II. Comprises of both biotic & abiotic component
C. Biosphere	III. Sheet of gases that surround the planet
D. Lithosphere	IV. Comprises of water

Choose the correct answer from the options given below:

(1) A-II, B-III, C-IV, D-I (2) A-III, B-IV, C-II, D-I

(3) A-IV, B-I, C-III, D-II (4) A-II, B-IV, C-I, D-III

[June 2023]

15. Who among the following developed the Gaia Hypothesis?

(1) E. S. Rowland (2) Mario Moling

(3) James E. Lovelock (4) William Golding

[June 2023]

16. Which layer of the atmosphere reflects back the radio waves that are transmitted from the earth?

(1) Troposphere (2) Stratosphere

(3) Ionosphere (4) Mesosphere

[June 2023]

17. Which one of the following mineral has a single chain structure?

(1) Olivine (2) Quartz

(3) Pyroxene (4) Amphibole

[June 2023]

18. Given below are two statements: One is lebelled as Assertion A and the other is labelled as Reason R.

Assertion A: The average composition of atmosphere near the surface of the earth is approximately 78.08% of N2. 20.95% of O2, 0.93% of Ar, 0.04% of CO2, adds to nearly 100%.

Reason R: Water content in atmosphere is variable ranging from <0.5% to 3.5% therefore, the average composition is given on dry weight percent basis (mixing ratio).

In the light of the above statements, choose the correct answer from the options given below:

(1) Both A and R are true and R is the correct explanation of A

(2) Both A and R are true but R is not the correct explanation of A

(3) A is true but R is false

(4) A is false but R is true

[March 2024]

19. A geographical unit delineated by sharp gradients and precipitation or snow melt flows along one side of the gradient, depending upon local topography and natural hydrology is called

(1) Basin (2) Catchment

(3) Region (4) Watershed

[March 2024]

20. Photochemical smog formation in ambient atmosphere requires

(A) Volatile hydrocarbons

(B) Ozone

(C) SO_2

(D) Sunlight temperature $(> 25°C)$

(E) NO_x

Choose the correct answer from the options given below:

(1) (A) and (D) only

(2) (A), (B), (C) and (D) only

(3) (B), (C), (D) and (E) only

(4) (A), (D) and (E) only

March 2024]

21. Stratospheric ozone protects us from

(1) UV A and microwave radiations

(2) UV B and UV C

(3) UV A and UV B

(4) UV A, B and C

[March 2024]

22. Which of the following greenhouse gas is not emitted from the landfill sites?

(1) Ozone (2) Nitrous oxide
(3) Methene (4) Water vapour

[March 2024]

23. Identify the correct statements.

(A) Eddy diffusion is a dominant mixing process in the stratosphere.
(B) Height of the troposphere at poles is less than that over the equator.
(C) Mean free path of molecules in the mesosphere is longer than that in the troposphere.

Choose the correct answer from the options given below:

(1) (A) and (B) only (2) (B) and (C) only
(3) (A) and (C) only (4) (A), (B) and (C)

[March 2024]

24. Earthquakes occur in _____.

(1) Crust and Upper Mantle
(2) Lower Mantle and Outer Core
(3) Inner and Outer Core
(4) Upper and Lower Mantle

[March 2024]

25. In asthenosphere, the velocity of S-waves thereby indicating that this zone consists of partly molten rocks.

(A) increases
(B) decreases
(C) remain constant
(D) first increases then decreases

Choose the correct answer from the options given below:

(1) (A) only (2) (B) only
(3) (C) only (4) (D) only

Answer Key									
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
(1)	(2)	(2)	(2)	(1)	(2)	(1)	(1)	(3)	(1)
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
(3)	(2)	(4)	(2)	(3)	(3)	(3)	(1)	(4)	(4)
21	**22**	**23**	**24**	**25**					
(2)	(1)	(2)	(1)	(2)					

[Practice Questions]

1. Which of the following gases is the most abundant in Earth's atmosphere?

(1) Oxygen (2) Nitrogen
(3) Argon (4) Carbon Dioxide

2. Which of the following is the correct order of layers in Earth's atmosphere from lowest to highest?

(1) Troposphere, Stratosphere, Mesosphere, Thermosphere, Exosphere
(2) Stratosphere, Mesosphere, Troposphere, Thermosphere, Exosphere
(3) Mesosphere, Troposphere, Stratosphere, Thermosphere, Exosphere
(4) Thermosphere, Stratosphere, Troposphere, Mesosphere, Exosphere

3. The concept of 'continental drift' was proposed by which scientist?

(1) Alfred Wegener (2) Harry Hess
(3) Charles Darwin (4) James Hutton

4. Which of the following processes is primarily responsible for the formation of sedimentary rocks?

(1) Erosion
(2) Compaction
(3) Weathering
(4) Metamorphism

5. Which type of seismic wave is the fastest and travels through both solid and liquid layers of Earth?

(1) S-waves
(2) P-waves
(3) Surface waves
(4) Rayleigh waves

6. The 'Ring of Fire' is associated with which type of geological activity?

(1) Earthquakes and volcanic eruptions
(2) Glacial melting
(3) Meteor impacts
(4) Landslides

7. Which of the following statements about the lithosphere is/are correct?

(i) The lithosphere includes both the crust and the uppermantle.
(ii) It is broken into tectonic plates that float on the asthenosphere.
(iii) The lithosphere is thicker under oceans than under continents.

Codes:

(1) i and ii (2) ii and iii
(3) i and iii (4) All of the above

(1) Gravitational differentiation
(2) Radiogenic decay
(3) Solar radiation absorption
(4) Thermal inversion

25. Which of the following is the primary source of dissolved salts in the ocean?
(1) Melting of polar ice caps
(2) Underwater volcanic activity
(3) Weathering of continental rocks
(4) Atmospheric deposition

Answer Key									
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
(2)	(1)	(1)	(3)	(2)	(1)	(1)	(1)	(1)	(2)
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
(4)	(2)	(2)	(2)	(4)	(2)	(1)	(4)	(3)	(4)
21	**22**	**23**	**24**	**25**					
(1)	(1)	(3)	(2)	(3)					

EXPLANATIONS

[Previous Year Exam Questions]

1. Correct Answer is (1):- The sky appears blue due to Rayleigh scattering, where shorter blue wavelengths of sunlight are scattered more by molecules and small particles in the Earth's atmosphere. This scattering causes blue light to spread throughout the sky, making it the dominant colour we see. In contrast, longer wavelengths like red are less scattered and pass through more directly.

2. Correct Answer is (2):- All weather and meteorological processes occur in the troposphere. This is the lowest layer of Earth's atmosphere, extending from the surface up to about 8-15 kilometres. It contains most of the atmosphere's water vapour and is where clouds form and weather events like rain and storms occur. The temperature decreases with altitude in the troposphere, which contributes to the dynamic weather patterns experienced on Earth.

3. Correct Answer is (2):- In the troposphere, temperature decreases with altitude, while in the stratosphere, temperature increases with altitude. This temperature gradient is due to the presence of water vapour and ozone: in the troposphere, the presence of water vapour causes the air to cool with height, whereas in the stratosphere, ozone absorbs UV radiation, causing the temperature to rise with altitude.

4. Correct Answer is (2):- The Richter scale is a logarithmic scale, meaning each increase of one unit represents a tenfold increase in the amplitude of seismic waves. This logarithmic nature allows it to measure a wide range of earthquake magnitudes accurately. For example, a magnitude 6 earthquake has ten times the wave amplitude of a magnitude 5 earthquake.

5. Correct Answer is (1):- More than 90% of the Earth's crust is made up of silicate minerals. These minerals include quartz, feldspar, and mica. Silicates contain silicon and oxygen and are crucial in forming most rocks. Their abundance is due to the common occurrence of silicon and oxygen in the Earth's crust.

6. Correct Answer is (2):- Capillary water is the most available form of soil water to plants. It is held in the soil by capillary forces and is easily accessible for plant roots. Hygroscopic water is tightly bound to soil particles and not readily available, while gravitational water drains away quickly. Water vapour is in the air and not in the soil.

7. Correct Answer is (1):- In India, thermal power has the highest installed capacity, primarily due to the extensive use of coal-fired power plants. This source dominates the energy mix compared to hydro, nuclear, and renewable sources. Thermal power provides a significant portion of the country's electricity needs. However, there is a growing focus on increasing renewable energy capacity.

8. Correct Answer is (1):- In the equatorial regions, the tropopause is about 18 kilometres high due to the warm, rising air, which extends the upper boundary of the troposphere. In high latitude regions, it is lower, around 10 kilometres, due to cooler temperatures and more stable atmospheric conditions. This difference is caused by variations in temperature and pressure with latitude.

9. Correct Answer is (3):- The thickness of the ozone layer is measured in Dobson Units. This unit represents the amount of ozone in a column of the atmosphere, where 1 Dobson Unit equals 0.01

millimetres of pure ozone at standard temperature and pressure. It provides a standard measure for monitoring changes in ozone concentration over time.

10. **Correct Answer is (1):-** Denitrification is considered undesirable in agriculture because it converts valuable soil nitrates into nitrogen gas, which escapes into the atmosphere. This process reduces the amount of usable nitrogen in the soil, diminishing soil fertility. Thus, Assertion A is correct, and Reason R explains why this loss occurs, making both statements true and linked.

11. **Correct Answer is (3):-**
Planetary Boundary Layer (A) - The lowest layer, closest to the Earth's surface.
Free Troposphere (B) - The layer above the planetary boundary layer.
Tropopause (C) - The boundary layer between the troposphere and the stratosphere.
Stratosphere (E) - Above the tropopause.

12. **Correct Answer is (2):-** The Earth's layers from the centre to the surface are:
(1) Inner Core (B) - Solid and very hot, at the Earth's centre.
(2) Outer Core (D) - Liquid layer surrounding the inner core.
(3) Mantle (C) - Thick layer between the outer core and the crust.
(4) Asthenosphere (E) - A semi-fluid layer within the upper mantle, beneath the lithosphere.
(5) Lithosphere (A) - The rigid outer layer, including the crust and upper mantle.

13. **Correct Answer is (4):-** Statement I is incorrect because the ocean is a major carbon reservoir, storing a significant portion of Earth's carbon. Statement II is correct as CO_2 remains in the ocean for longer periods compared to the atmosphere, due to its role in long-term carbon storage. Thus, the ocean's role in carbon sequestration is crucial, and CO_2 residence time is indeed longer in the ocean.

14. **Correct Answer is (2):-** The atmosphere is the layer of gases that surrounds the Earth, providing the air we breathe. The hydrosphere includes all of Earth's water, such as oceans, rivers, and lakes. The biosphere encompasses all living organisms and their interactions with both biotic and abiotic components of the environment. The lithosphere refers to the outermost layer of the Earth, which includes the crust and the upper mantle. Each of these spheres interacts with the others to support life and maintain Earth's systems.

15. **Correct Answer is (3):-** The Gaia Hypothesis, proposed by James E. Lovelock, suggests that the Earth functions as a self-regulating system, where living organisms interact with their environment to maintain conditions suitable for life. This concept emphasizes the interconnectedness of all life forms with the Earth's systems, promoting the idea that the planet acts as a single, living entity. Lovelock's work has significantly influenced environmental science and ecological thinking.

16. **Correct Answer is (3):-** The ionosphere is a layer of Earth's atmosphere that contains a high concentration of ions and free electrons, which are capable of reflecting radio waves. This property allows the ionosphere to bounce radio signals back to the Earth's surface, enabling long-distance communication, such as shortwave radio transmissions. The other layers of the atmosphere, like the troposphere, stratosphere, and mesosphere, do not have this capability.

17. **Correct Answer is (3):-** Pyroxene minerals have a single chain silicate structure, where silica tetrahedra are linked together in a linear chain. This structure is distinct from other minerals like olivine, which has an isolated tetrahedral structure, quartz with a three-dimensional framework, and amphibole, which has a double chain structure. Pyroxenes are common in igneous and metamorphic rocks due to their stability at high temperatures and pressures.

18. **Correct Answer is (1):-** The Earth's atmosphere is composed primarily of nitrogen (78.08%), oxygen (20.95%), argon (0.93%), and carbon dioxide (0.04%), which together account for nearly 100% of the air's composition when water vapor is excluded. Water vapor content in the atmosphere can vary significantly, typically ranging from less than 0.5% to 3.5%, depending on factors like temperature and humidity. Because of this variability, the average composition of the atmosphere is often given based on dry air, excluding water vapor.