



Environmental Science & Other Innovations:

Environmental Science

Total Lunar Eclipse : The early hours of September 8, 2025, marked the end of a total lunar eclipse, commonly known as a "Blood Moon." This celestial event, which began on September 7, captivated billions as Earth's shadow swept across the moon, giving it a deep red glow. The phenomenon is caused by Rayleigh scattering, where the Earth's atmosphere filters out shorter wavelengths of light (like blue) while allowing longer wavelengths (red and orange) to pass through and illuminate the moon. The eclipse's totality phase lasted an impressive 82 minutes, making it one of the longest in recent years.

Heat Stress Study : A new study by Greenpeace India, released today, highlights a strong connection between rising heat stress and a surge in unrecognised human deaths in Delhi, particularly among the city's vulnerable population. The study used the Universal Thermal Climate Index (UTCI), which factors in humidity, wind speed, and solar radiation, to provide a more accurate measure of heat stress than traditional temperature readings. The findings indicate that heat stress is now a year-round threat, extending beyond summer into the monsoon months due to high humidity.

Carbon Capture Technology: A discussion on the need for stronger policy and industry initiatives for the large-scale deployment of Carbon Capture, Utilization, and Storage (CCUS) in India was featured in a report today. The technology is seen as a critical step in reducing the carbon

footprint of the power sector, with potential to retrofit existing coal and gas plants and also create negative emissions when integrated with bioenergy.

Other Innovations

Top Emerging Technologies : The World Economic Forum's "Top 10 Emerging Technologies of 2025" report outlines several innovations set to have a significant impact. Key among them are structural battery composites for lighter and more efficient electric vehicles, osmotic power systems that generate clean energy from water salinity, and green nitrogen fixation, a sustainable method for producing fertilizer.

AI and R&D: At the annual Innovation Day event, discussions centered on the growing imperative to integrate AI into the research and development (R&D) lifecycle. The technology is being used to yield faster, smarter, and more scalable outcomes, leading to reduced time-to-market for new products and long-term competitive advantages.

New Materials: Researchers at the University of Copenhagen have created a new material called BAETA from old plastic bottles. The material is designed to efficiently capture carbon dioxide from the air. This innovation is energy-efficient and scalable, offering a new solution for carbon capture.

Dear Aspirants,

Stay updated with **important lessons, tutorials, and announcements** by subscribing to our official

WhatsApp Channel!





spardhaguru2022



Spardhaguru Current affairs



Spardhaguru1



SpardhaGuru



Spardha.guru



www.spardha.guru



Scan the QR code below to join and never miss an update!

Thank you for your continued support and enthusiasm.

Let's keep learning and growing together!



MCQS

1.What is the scientific phenomenon that causes the Moon to appear red during a total lunar eclipse?

- A) The Moon's volcanic activity.
- B) Rayleigh scattering in Earth's atmosphere.
- C) A reflection of light from Mars.
- D) Sunspots on the Sun's surface.

Answer: B) Rayleigh scattering in Earth's atmosphere.

The text states that the reddish color of the "Blood Moon" is a result of Rayleigh scattering, where Earth's atmosphere filters out blue light and allows red and orange light to pass through and illuminate the Moon.

2.What does the Universal Thermal Climate Index (UTCI) factor in to measure heat stress more accurately than traditional temperature readings?

- A) Air pressure and altitude.
- B) Humidity, wind speed, and solar radiation.
- C) The Earth's magnetic field.
- D) The time of day and year.

Answer: B) Humidity, wind speed, and solar radiation.

The article specifies that the Universal Thermal Climate Index (UTCI) "factors in humidity, wind speed, and solar radiation" to provide a more accurate measure of heat stress.

3.According to the provided text, what is one of the key emerging technologies from the World Economic Forum's 2025 report?

- A) Supersonic travel.
- B) Green nitrogen fixation.
- C) Personalized medicine.
- D) Quantum computing.

Answer: B) Green nitrogen fixation.

The text lists green nitrogen fixation as a "key" innovation from the World Economic Forum's "Top 10 Emerging Technologies of 2025" report, along with structural battery composites and osmotic power systems.

4.What is the new material created from old plastic bottles by researchers at the University of Copenhagen designed to do?

- A) Produce renewable energy.
- B) Filter water contaminants.
- C) Capture carbon dioxide from the air.





D) Create biodegradable plastics.

Answer: C) Capture carbon dioxide from the air.
The article states that the new material, named BAETA, is "designed to efficiently capture carbon dioxide from the air."

5. Why is the integration of AI into the R&D lifecycle considered important, according to the text?

- A) It reduces the cost of raw materials.
- B) It helps in marketing and sales.
- C) It provides faster, smarter, and more scalable outcomes.
- D) It helps in managing human resources.

Answer: C) It provides faster, smarter, and more scalable outcomes.

The text notes that AI is being used in R&D "to yield faster, smarter, and more scalable outcomes, leading to reduced time-to-market for new products."



Der Aspirants,

Spardhaguru India Private Limited

Stay updated with **important lessons, tutorials, and announcements** by subscribing to our official **YouTube Channel!**

Scan the QR code below to subscribe and never miss an update!

Thank you for your continued support and enthusiasm. Let's keep learning together!

