



Balalatha's

# CSB IAS ACADEMY

The Road Map to Mussoorie...



PRELIMS EDGE – 2025 – 01/11/2024

## LIDAR :

**Context:** Scientists have detected a lost Mayan city, hidden for centuries by the dense Mexican jungle, using LiDAR.

### About LIDAR

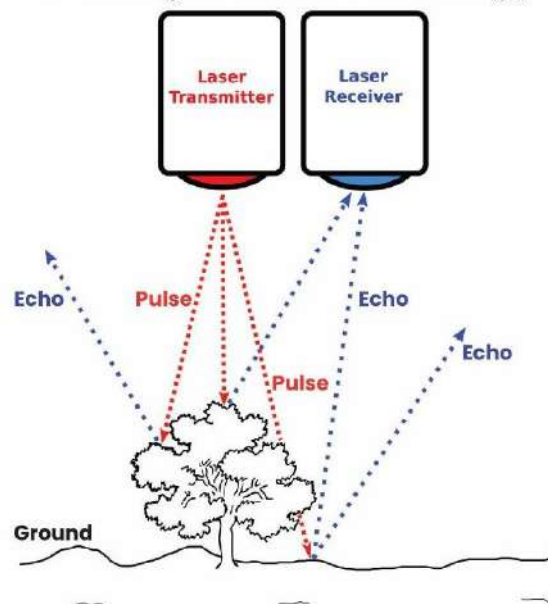
- Lidar, which stands for **Light Detection and Ranging**, is a **remote sensing method** that uses light in the form of a **pulsed laser** to measure ranges (variable distances) to the Earth.
- These light pulses—combined with other data recorded by the airborne system — generate precise, **three-dimensional information** about the shape of the Earth and its surface characteristics.
- A lidar instrument principally consists of a laser, a scanner, and a specialized GPS receiver.
- **Airplanes and helicopters** are the most commonly used platforms for acquiring lidar data over broad areas.

### How Does it Work?

- A LiDAR system calculates how long it takes for beams of light to hit an object or surface and **reflect back to the laser scanner**.
- The distance is then calculated using the velocity of light. These are known as **'Time of Flight'** measurements.

Two types of lidar are topographic and bathymetric.

### Working of LiDAR Technology



- **Topographic lidar** typically uses a near-infrared laser to map the land, while **bathymetric lidar** uses water-penetrating green light to also measure seafloor and riverbed elevations.
- Lidar systems allow scientists and mapping professionals to examine both natural and man-made environments with accuracy, precision, and flexibility.
- It is used in a wide range of land management and planning efforts, including hazard assessment (including lava flows, landslides, tsunamis, and floods), forestry, agriculture, geologic mapping, and watershed and river surveys.
- LiDAR works in a similar way to **Radar and Sonar** yet uses light waves from a laser, instead of radio or sound waves.

*Source: LiDAR: Remote sensing system which helped discover lost Mayan city (The Indian Express)*

### **Air Quality Index :**

**Context:** The Air Quality Index (AQI) in New Delhi goes into a nose dive according to the data published by the Central Pollution Control Board.

### **About Air Quality Index**

- AQI aims to measure how safe the air around you is for breathing.
- It was launched by Central Pollution Control Board in 2014.

### **Measuring criteria**

1. 24 hours average data.
2. Its unit is micrograms per cubic meter.
3. Each pollutants quantity in the air is adjusted to a common scale (say, 0 to 500) that works for all pollutants.

### **Pollutants Covered**

1. Particulate matter (PM2.5)
2. Particulate matter<sub>10</sub> (PM10)
3. Ozone (O<sub>3</sub>)
4. Carbon Monoxide (CO)
5. Nitrogen Dioxide (NO<sub>2</sub>)

6. Sulphur Dioxide (SO<sub>2</sub>)
7. Lead (Pb)
8. Ammonia (NH<sub>3</sub>)

#### Number of categories

- Six: Good, Satisfactory, Moderately Polluted, Poor, Very Poor and Severe.

**CENTRAL POLLUTION CONTROL BOARD'S  
AIR QUALITY STANDARDS**

AIR QUALITY INDEX (AQI)	CATEGORY
0-50	Good
51-100	Satisfactory
101-200	Moderate
201-300	Poor
301-400	Very Poor
401-500	Severe

*Source: Delhi air pollution: Relentless firecracker bursting during Diwali shrouds city in smog (The Hindu)*

#### Places in News

#### Spain :

- Spain is located in southwestern Europe occupying most (about 82 per cent) of the **Iberian Peninsula**.
- Its mainland is bordered by the Mediterranean Sea (except for the small British territory of Gibraltar); by France, Andorra, and the Bay of Biscay; and by the Atlantic Ocean and Portugal.
- It is the largest country in **Southern Europe** and the fourth-most populous European Union member state.
- During the Age of Discovery, Spain pioneered the exploration of the New World, made the first circumnavigation of the globe and formed one of the largest empires in history.
- Currently Spain is a **secular parliamentary democracy and a constitutional monarchy**
- Spain is known to be one of the warmest and sunniest countries in Europe regardless of the season due to the presence of **Mediterranean Sea**
- The official languages of Spain are Castilian Spanish, Basque, Catalan, and Galician.

- **Spanish** is the world's second-most spoken native language.
- **Catalonia** is one of Spain's most distinctive autonomous communities.
- There has been a rise of local nationalism as demonstrated in the developments surrounding the independence of Catalonia.
- Spain is currently experiencing a **migrant crisis**, with a large number of migrants from Middle East and North Africa arriving in the country and attempting to cross the border illegally.



#### Valeriana :

- A Mayan city lost in the dense jungle of southern **Mexico** has been revealed.
- Named Valeriana, the city is believed to have been **founded before 150 AD**.
- The discovery occurred in the southeastern state of Campeche, and archaeologists have named it Valeriana, after a nearby freshwater lagoon.
- Scientists employed state-of-the-art technology: lasers, drones, and satellite maps.
- With these tools, they discovered a city hidden for centuries beneath the thick Mexican jungle, unearthing pyramids, enclosed plazas, and an ancient reservoir.



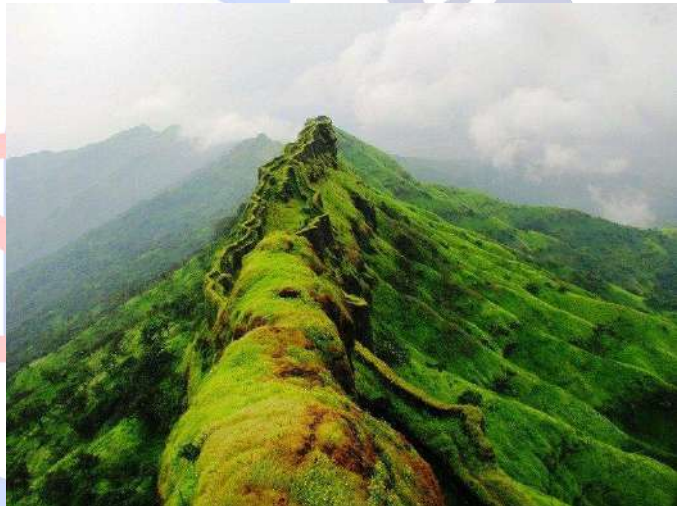
#### About Mayan Civilization :

- The Mayas are probably the best-known of the **classical civilizations of Mesoamerica**.
- Originating in the **Yucatán peninsula** around 2600 B.C., they rose to prominence around A.D. 250 in present-day southern Mexico, Guatemala, northern Belize and western Honduras.
- Building on the inherited inventions and ideas of earlier civilizations, the Maya developed astronomy, calendrical systems and hieroglyphic writing.

- The Mayas were noted as well for elaborate and highly decorated ceremonial architecture, including temple pyramids, palaces and observatories, all built without metal tools.
- They were also skilled farmers, clearing large sections of tropical rainforest and, where groundwater was scarce, building sizable underground reservoirs for the storage of rainwater.

### Raigad Fort

- The fort of Raigad is part of the 12 forts recently **nominated for UNESCO World Heritage under the title “Maratha Military Landscapes of India”**.
- Raigad is a hill fort situated in the Raigad district of **Maharashtra**.
- In **1653 CE**, Raigad (then known as Rairi) was captured by the Maratha forces from the Mores'.
- The fort served as the **2nd capital of Chhatrapati Shivaji Maharaj** and played an important role in the administration and expansion of the Maratha Kingdom.
- The fort also overlooks an artificial lake known as the **‘Ganga Sagar Lake’**.
- Besides the lake, an important feature nestled within the fort complex is a Shiva temple called Jagadishwar Mandir.
- Raigad, surrounded by valleys shaped by the Kal and Gandhari rivers, stands as an isolated massif without connections to neighbouring hills.
- Samadhi of Chhatrapati Shivaji Maharaj - Adjacent to the Temple, the Samadhi of Chhatrapati Shivaji Maharaj is located almost opposite to the eastern entrance of Jagadishwar Mandir.



### Practice Questions

#### **Q1: Consider the following statements regarding LIDAR Technology**

1. It is a remote sensing method that uses light in the form of a pulsed laser to measure variable distances to the Earth.

2. LIDAR Measurements are known as 'Time of Flight' measurements.
3. LiDAR works in a similar way to Radar and Sonar yet uses light waves from a laser, instead of radio or sound waves.

**How many of the above statements are incorrect?**

- a) Only One
- b) Only Two
- c) All of the above
- d) None of the above

**Q2 : Which one among the following pollutants is not measured by to prepare the Air Quality Index of National Capital Region?**

- a) Ozone (O<sub>3</sub>)
- b) Carbon Monoxide (CO)
- c) Nitrogen Dioxide (NO<sub>2</sub>)
- d) Methane

**Q3 : Catalonia, an autonomous region is located in which among the following countries of Europe?**

- a) Italy
- b) Spain
- c) Portugal
- d) Greece

**Q4 : The Mayan Civilization often seen in the news recently is located in which of the following geographical regions?**

- a) Iberian Peninsula
- b) Yucatan Peninsula

- c) Kamchatka Peninsula
- d) Tasman Peninsula

**Q5 : The Raigad Fort was an important Political and Military Centre of which of the following Rulers?**

- a) Aurangzeb
- b) Chhatrapati Shivaji
- c) Harshavardhana
- d) Mahendra Varman

**Answers**

- 1. D
- 2. D
- 3. B
- 4. B ★
- 5. B

