



## Daily Current Affairs Prelims Quiz 04-09-2024 (Online Prelims Test)

1) Consider the following statements with respect to Aditya-L1

1. Aditya-L1 is a multi-wavelength, multi-directional, multi-spatial and multi-instrument observatory.
2. Before arriving at L1, it hovered in an oval orbit around L1, to conserve the fuel.

Which of the above statement(s) is/are correct?

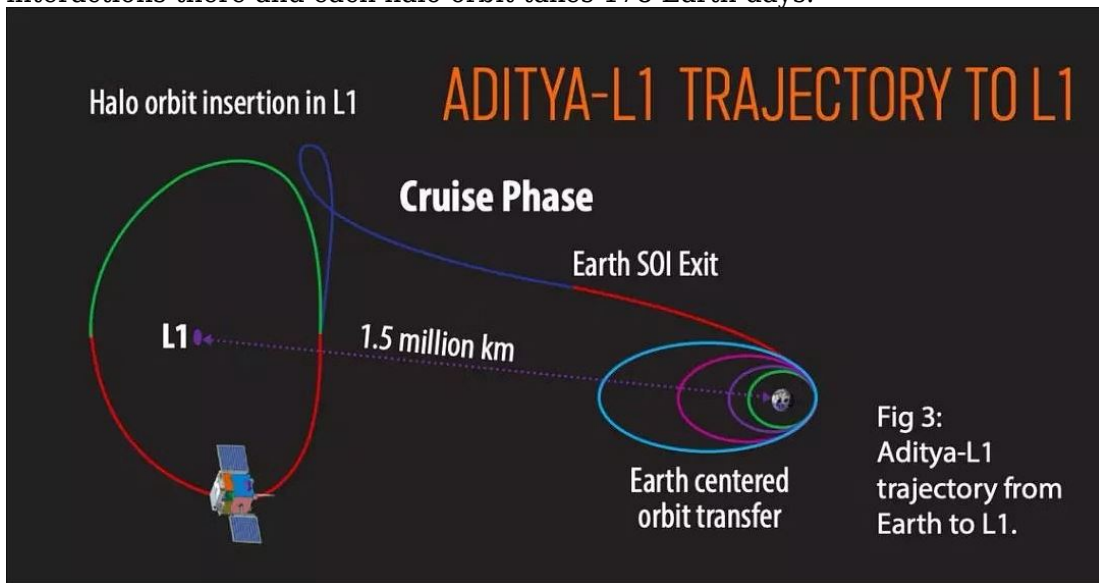
- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer : a

### Aditya-L1

- Aditya-L1 aims to conduct magnetic field measurements in the corona and understand the interaction of charged particles in solar winds with Earth's atmosphere and satellites.
- It also intends to understand those processes inside the Sun, which lead to solar flares, coronal mass ejections and geomagnetic storms.
- **Objectives of it includes:**
  - Study of Solar upper atmospheric (chromosphere and corona) dynamics.
  - Study of chromospheric and coronal heating, physics of the partially ionized plasma, initiation of the coronal mass ejections, and flares
  - Observe the in-situ particle and plasma environment providing data for the study of particle dynamics from the Sun.
  - Physics of solar corona and its heating mechanism.
  - Diagnostics of the coronal and coronal loops plasma: Temperature, velocity and density.
  - Development, dynamics and origin of CMEs.
  - Identify the sequence of processes that occur at multiple layers (chromosphere, base and extended corona) which eventually leads to solar eruptive events.
  - Magnetic field topology and magnetic field measurements in the solar corona.
  - Drivers for space weather (origin, composition and dynamics of solar wind).
- The observatory is expected to **function for at least five years**, and as space records go, it will likely function for much longer than that.
- **Orbital Position** - Located at L1, about 1.5 million km from Earth.
- It provides an uninterrupted view of the Sun and allows fuel conservation due to balanced gravitational forces.
- Aditya-L1 performed a manoeuvre called 'Trans-Lagrangian Point 1 Insertion', entering the trajectory towards L1.
- The spacecraft is in an equilibrium state and a stable position, and simply **hovers in a halo orbit** around L1, without spending much fuel.
- A halo orbit is neither a perfect circle nor an oval, but a lopsided shape known as a lissajous figure.

- Lissajous figure is a pattern formed due to the complicated geometry of gravitational interactions there and each halo orbit takes 178 Earth days.



- **Scientific Instruments:**

- Equipped with 7 payloads (4 remote sensing, 3 in-situ).

- **Instruments include:**

- Visible Emission Line Coronagraph (VELC)
- Solar Low Energy X-ray Spectrometer (SoLEXS)
- Solar Ultraviolet Imaging Telescope (SUIT)
- High Energy L1 Orbiting X-ray Spectrometer (HEL1OS)

- **In-situ payloads include:**

- Aditya Solar wind Particle Experiment (ASPEX),
- Plasma Analyser Package for Aditya (PAPA) and
- Advanced Tri-axial High Resolution Digital Magnetometers.



- **Key Achievements:**

- First Indian spacecraft to reach L1.
- Exited Earth's gravitational sphere of influence and captured first high-energy X-rays from solar flares.
- Obtained full-disk images of the Sun in near-ultraviolet wavelengths.
- Measured energy variations in solar wind particles and deployed a 6-meter magnetometer boom for magnetic field measurements.

- **Scientific Observations:**

- Detected and analysed coronal mass ejections.
- Studied geomagnetic storms and their effects.
- Captured images of sunspots and active regions.
- Provided data on space weather conditions.

- **Future Goals:**

- Better understand coronal heating mechanisms.
- Study nuclear fusion reactions inside the Sun.
- Investigate the temperature difference between the Sun's core and corona.
- Improve space weather predictions and understanding of solar-terrestrial interactions.
- The mission is expected to contribute valuable data to the global scientific community's understanding of our star and its effects on Earth's space environment.

2) Kalasa Nala Diversion Project, sometimes seen in the news recently, aims to divert which of the

following river?

- a. Kaveri River
- b. Mahadayi River
- c. Krishna River
- d. Tungabhadra River

Answer : b

## **Kalasa Nala Diversion Project**

*National Wildlife Board has declined to grant clearance for the Kalasa Nala Diversion Project, citing ongoing legal challenges by the Goa government in the Supreme Court pertaining to the Mahadayi project.*

- The Kalasa Nala Diversion Project aims to divert water from the **Mahadayi River** to meet the drinking water needs of the drought-prone regions of Karnataka.
- It involves using 10.68 hectares of forest from the Kali and Sahyadri Tiger Reserves.
- **Environmental and Political Implications** - The decisions highlight the tension between development needs and environmental conservation.
- There's potential for increased conflict between Karnataka and Goa over these projects.
- Environmentalists argue that the Goa-Tamnar project approval undermines Karnataka's ecological interests and sets a dangerous precedent.
- **Legal and Procedural Aspects** - The Kalasa Nala project's clearance is complicated by ongoing Supreme Court cases.
- For the Goa-Tamnar project, previous recommendations by forestry officials and the Central Empowered Committee have been seemingly overridden.
- There are concerns about potential violations of Supreme Court judgments regarding the protection of ecologically sensitive zones.
- **Mahadayi River** - Originates in the Western Ghats and flows 35 km in Karnataka and 52 km in Goa.
- The downstream state constitutes a large part of the river's catchment (78 %), which also includes runoff from Maharashtra, although the main stem of the river does not flow through that state.
- Maharashtra, as a result, is also party to the water-sharing dispute.



3) Consider the following statements with respect to Great Indian Bustard

1. They are cryptic and vagile birds occupying large landscapes without distinct boundaries.
2. It is a flagship species and acts as indicator species to indicate the health of our grasslands or pulse of grassland ecosystem.
3. It is listed in the Schedule I of the Indian Wildlife (Protection) Act, 1972 and under the Appendix I of Convention on International Trade in Endangered Species (CITES).

How many of the statements given above are correct?

- a. Only one
- b. Only two
- c. All three
- d. None of the above

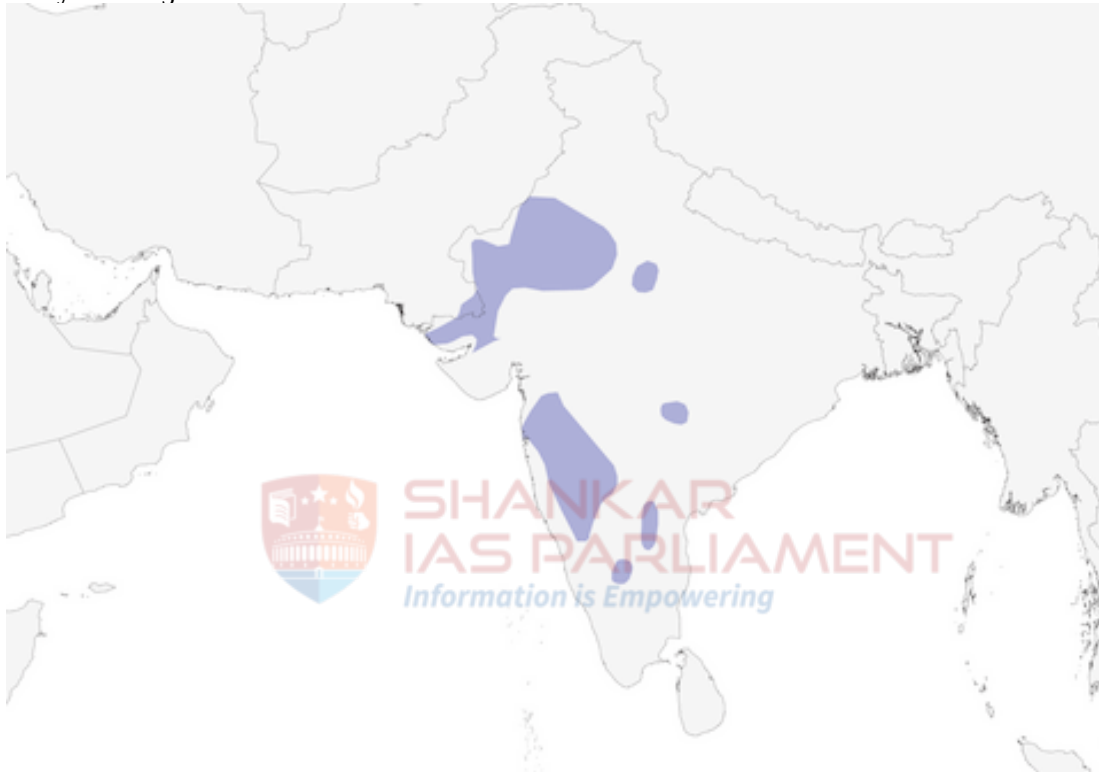
Answer : c

### Great Indian Bustard (*Ardeotis nigriceps*)

*Recently Compensatory Afforestation Fund Management and Planning Authority (CAMPA) approved funding for the next phase of the conservation program of the Great Indian Bustard for the 2024-2029.*

- The great Indian bustard can easily be distinguished by its black crown on the forehead contrasting with the pale neck and head.
- It is **flagship species and a key indicator species** of the grassland habitat, which means its survival also signals the health of grassland habitats.
- Rajasthan State in India holds the largest population.
- They are **cryptic and vagile birds** occupying large landscapes without distinct boundaries that make complete enumeration of population impractical and unreliable.

- **Habitat and distribution** - Historically, the great Indian bustard was distributed throughout Western India, spanning 11 states, as well as parts of Pakistan.
- Its stronghold was once the Thar Desert in the north-west and the Deccan plateau of the peninsula.
- Today, its population is **confined mostly to Rajasthan and Gujarat.**
- **Small population occur in Maharashtra, Karnataka and Andhra Pradesh.**
- Bustards *generally favour flat open landscapes* with minimal visual obstruction and disturbance, therefore adapt well in grasslands.
- In the non-breeding season they frequent wide agro-grass scrub landscapes.
- While in the breeding season (summers and monsoons) they congregate in traditional undisturbed grassland patches characterized by a mosaic of scantily grazed tall grass (below 50 cm).
- They avoid grasses taller than themselves and dense scrub like thickets.



- **Threats** - Habitat loss and alteration as a result of widespread agricultural expansion and mechanized farming.
- Infrastructural development such as irrigation, roads, electric poles, as well as mining and industrialization.
- The GIB population has been rapidly declining due to habitat loss across several states.
- **Conservation** - It is listed in Schedule I of the Indian Wildlife (Protection) Act, 1972.
- It is included in the CMS Convention and in **Appendix I** of Convention on International Trade in Endangered Species (CITES).
- It is classified as '**Critically Endangered**' on the International Union for Conservation of Nature Red List.
- It is also conserved under the National Wildlife Action Plan (2002-2016).
- It has also been identified as one of the species for the recovery programme under the Integrated Development of Wildlife Habitats of the Ministry of Environment and Forests.
- Emergency action by the Forest department of the Karnataka state government include:
  - Geo-tagging the birds and artificially incubating eggs, reintroducing young birds to the wild,
  - Raising awareness among local communities and
  - Establishing a research centre in Ballari district of Karnataka.



4) Consider the following statements:

**Statement-I:** Pumped storage hydropower (PSH) is a large-scale method that uses the principle of gravity to generate electricity.

**Statement-II:** Pumped storage hydropower (PSH) acts similarly to a giant battery that can store power and then release it when needed.

Select the correct answer using the codes given below:

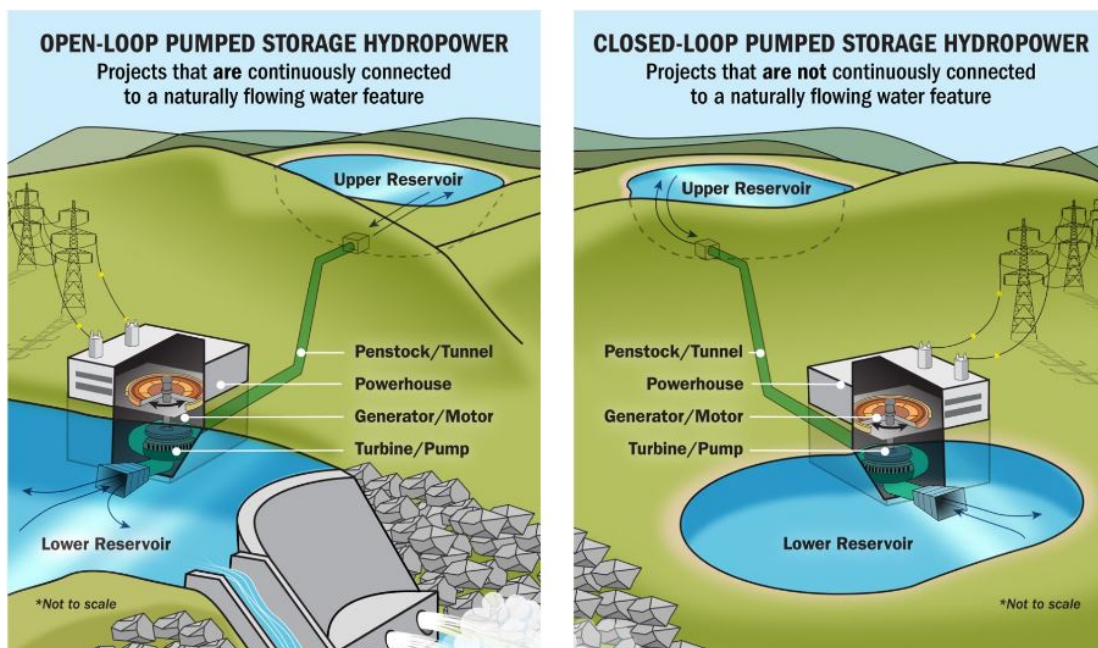
- a. Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- b. Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- c. Statement-I is correct but Statement-II is incorrect
- d. Statement-I is incorrect but Statement-II is correct

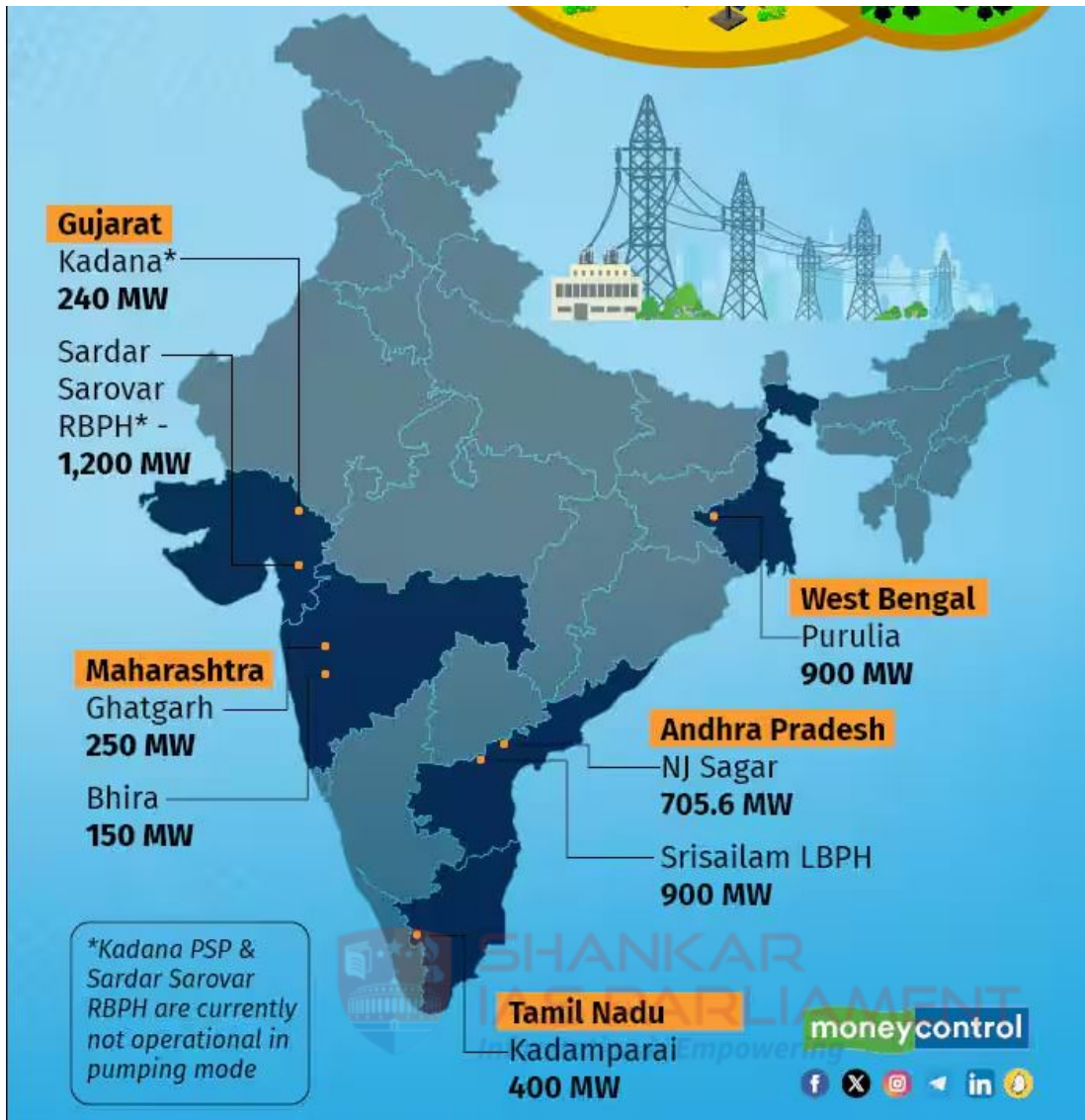
Answer : b

### Pumped Storage Hydropower (PSH)

*In the global shift towards renewable energy sources, energy storage solutions are gaining prominence and Pumped Storage Hydropower (PSH) is emerging as a reliable and versatile technology.*

- Pumped storage hydropower (PSH) is a type of hydroelectric energy storage.
- The first known use cases of PSH were found in Italy and Switzerland in the 1890s.
- PSH is a large-scale method that **uses the principle of gravity** to generate electricity.
- It is a configuration of **two water reservoirs at different elevations** that can generate power as water moves down from one to the other (discharge), passing through a turbine.
- The system also **requires power** as it pumps water back into the upper reservoir (recharge).
- PSH acts **similarly to a giant battery**, because it can store power and then release it when needed
- **Advantages of PSH** - PSH systems are known for their reliability and longevity.
- During periods of low electricity demand, excess electricity from the grid is used to pump water from the lower reservoir to the upper reservoir.
- When the electricity demand increases, the stored water is released back to the lower reservoir, passing through turbines to generate electricity.





5) Consider the following statements with respect to Vishanu Yuddh Abhyas

1. It is a mock drill on pandemic preparedness that aims to evaluate the readiness and response of the National Joint Outbreak Response Team (NJORT).
2. It is a first-of-its-kind mock drill that is conducted under the aegis of National One Health Mission (NOHM).

Which of the above statement(s) is/are **incorrect**?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer : d

### **Vishanu Yuddh Abhyas (Virus War Exercise)**

*Vishanu Yuddh Abhyas is a first-of-its-kind mock drill to assess pandemic preparedness that was recently conducted in the Ajmer district of Rajasthan state.*

- Vishanu Yuddh Abhyas is a first-of-its-kind mock drill on Pandemic Preparedness.

- It was conducted in Ajmer district of Rajasthan state under the aegis of the National One Health Mission (NOHM).
- This exercise aimed to evaluate the readiness and response of the *National Joint Outbreak Response Team (NJORT)* composed of experts from human health, animal husbandry and wildlife sectors.
- A mock zoonotic disease outbreak scenario was created to simulate a real-world outbreak.
- The drill involved multiple stakeholders that include:
  - National Centre for Disease Control (NCDC) and Indian Council of Medical Research (ICMR),
  - Directorate General of Health Services (DGHS), Department of Animal Husbandry and Dairying (DAHD),
  - Ministry of Environment, Forest, and Climate Change (MoEF&CC), Indian Council of Agricultural Research (ICAR),
  - Rajasthan State Administration, State Directorate of Health Services (DHS), State Veterinary Department and State Forest Department and others.
- The drill was structured around **two key components**:
  1. Investigation and identification of the virus responsible for the mock outbreak.
  2. Actions initiated to control the spread of illness across human and animal populations.
- Independent observers monitored the response.
- The response of the district and state teams, directed by NJORT was found to be mostly prompt and appropriate.
- The exercise also identified some areas requiring further improvement.

