

### Economy

#### Commission of Railway Safety (CRS):

- Vande Bharat Express is prone to serious accidents even in cases of a cattle run-over, says a report on railway safety by CRS.
- CRS works under **administrative control of Ministry of Civil Aviation**. The reason behind this is to keep CRS insulated from influence of country's railway establishment and **prevent conflicts of interest**.
- It deals with matters pertaining to **safety of rail travel and train operation**.
- In May 1941, Railway Inspectorate was separated from the Railway Board and placed under the control of the Department of Posts and Air at that time.
- Later in 1961, the Inspectorate was renamed as CRS (Commissioner of Railway Safety), and it has been under authority of central ministry responsible for civil aviation in India ever since.
- Commission is charged with certain **statutory functions** as laid down in **Railways Act (1989) and Metro Railway (Operations and Maintenance) Act, 2002**.
- These functions are of an **inspectorial, investigatory & advisory nature**.
- Commission functions according to certain rules viz. Statutory investigation into accidents rules framed under the Railways Act and executive instructions issued from time to time.
- It is **Headquartered in Lucknow, Uttar Pradesh**.

(TH)

#### Tanning:

- It is the **process in leather-making in which the hide, already taken from an animal, is processed** to remove hair and tissue, and built into a resilient material.
- Tanning derives its name from **tannic, acidic agent that helps cure the hide**.
- Tanneries **release heavy metals, such as chromium and mercury**, into waterbodies and soil.
- **Health impact:** respiratory ailments, neurological disorders, behavioural changes, and skin conditions.
- **Kanpur, known as the 'Leather City of India'**, has over 200 active tanneries spread across a 15-km area.

(TH)

### Ecology & Environment

#### Tardigrades or Water bears:

- Among the studies set to be carried out at Axiom Mission 4 is **ISRO's Voyager Tardigrades project**, which will investigate revival, survival, and reproduction of tardigrades – creatures that have long fascinated scientists.
- Tardigrades are **microscopic eight-legged animals measuring between 0.1 and 0.5 millimetres**.
- They are known for **surviving the direst physical environments**, from arid regions to high up in Himalayas.
- They can also **go without food or water for up to years**, although their **average lifespan is not more than a decade**.
- This incredible resilience is why the animals **have been on Earth for around 600 million years**.
- They **pull their eight little legs and head inside their cuticle, which is an exoskeleton**. They essentially curl into **tiny ball-like structures known as tuns**. When their

physical environment improves, they can return to their normal selves.

- Tardigrades are **only known animals capable of surviving even in cold vacuum of Space**.
- In 2007, a crewless Russian capsule on a European Space Agency (ESA) mission exposed some 3,000 tardigrades to the vacuum of space for 10 days, and they were left out there in low-Earth orbit (altitude under 2,000 km). Over two-thirds of the animals survived the mission and even gave birth to offspring upon returning to Earth.
- **ISRO project will examine the revival of dormant tardigrades, count the number of eggs laid and hatched during a mission**, and compare the gene expression patterns of spaceflown vs. ground control populations.
- The research seeks to identify molecular mechanisms of resilience, potentially furthering understanding about the limits of life in extreme environments.
- This **knowledge could inform future space exploration and help develop biotechnology applications on Earth**.

(IE)

#### Why is Europe warming faster than the world?

- **Europe has warmed about twice as much as the world as a whole**, as highlighted by the **2024 European State of the Climate Report**.
- European State of Climate Report - an **annual publication of Copernicus Climate Change Service, which is part of the European Commission** - captures climate trends in Europe and is **published in collaboration with the World Meteorological Organisation**.
- Year 2024 breached the 1.5-degree Celsius global warming for the first time.
- Europe, however, has seen its average annual temperature rise by about 2.4 degree Celsius compared with pre-industrial times.

#### Reasons for higher warming in Europe:

- **Arctic Effect/Arctic amplification:** Arctic is known to be **warming three to four times faster than global average**, and accounts for substantial part of average global warming. **Substantial part of Europe lies in the Arctic region and warming around the poles**. The contribution of warming around the North Pole pushes average for Europe.
- **Albedo effect:** The **ice cover in Arctic is melting**, because of which more land or water is getting exposed to the Sun. **Ice traps the least amount of heat, reflecting most solar radiation back**. Land or water, which are darker surfaces, tend to absorb solar radiation better, leading to higher degrees of warming.
- **Reduction in aerosols emissions:** Aerosols refer to **all kinds of tiny solid and liquid particles suspended** in atmosphere, and largely consist of air pollutants. These particles are **able to scatter sunlight back so that there is less absorption of solar radiation by the Earth's surface**. Aerosols also help in **cloud formation and clouds**, in turn, have an impact on how much sunlight is reflected or absorbed. **Europe having relatively cleaner air and less emission of aerosols contributes to a faster warming**.
- **Urban heat island effect:** **Most of the Europe has urbanised** leading to low albedo of land surface and more trapping of heat.

(IE)

### History, Art & Culture

#### Guru Teg Bahadur (1621 to 1675):

- Prime Minister paid tribute to Sri Guru Teg Bahadur on the auspicious Parkash Purab on 18<sup>th</sup> April 2025.
- Initially called as Tyag Mal because of his ascetic nature. At the age of 13, he distinguished himself in battle against a Mughal chieftain and his bravery and swordsmanship in battle earned him name of Togh Bahadur
- Became 9th Sikh Guru in 1664 following footsteps of his grand-nephew and the eighth Guru, Guru Har Krishan Ji.
- Propagated message of universal brotherhood and religious freedom.
- Crowned with the rare honour of 'Hind Di Chadar' as he sacrificed everything for sake of righteousness, mother land and rights of people.
- His spiritual writings registered in the form of 116 poetic hymns in the sacred scripture, the Sri Guru Granth Sahib.
- Founded the town of Chak-Nanki in Punjab, later enlarged by the tenth Nanak, Guru Gobind Singh Ji, into the city of Sri Anandpur Sahib.
- Resisted forced conversions, and for himself refusing to convert to Islam, he was publicly executed on the orders of Emperor Aurangzeb, along with three other Sikhs, Bhai Mati Das, Bhai Sati Das, and Bhai Dyal Das.

(PIB)

### Defence & Security

#### EXERCISE DESERT FLAG-10:

- A contingent of Indian Air Force reached Al Dhafra Air Base in United Arab Emirates to participate in Exercise Desert Flag-10.
- It is a multinational air combat exercise being hosted by UAE Air Force, with participating contingents from Air Forces of Australia, Bahrain, France, Germany, Qatar Saudi

Arabia, Republic of Korea, Turkey, UAE, United Kingdom, and the United States in addition to the Indian Air Force.

- It is scheduled to take place between 21 April to 08 May 2025.

(PIB)

### Science & Technology

#### Biofoundry:

- It is a specialized facility that accelerates the design, construction, and testing of biological systems using automated tools and high-throughput technologies.
- It integrates various processes like DNA synthesis, gene editing, and strain engineering into a streamlined workflow.
- Essentially, a biofoundry is a "factory" for biological parts and systems, enabling rapid prototyping and iteration.

(PIB)

### Geography/Places in the News

#### Muhuri River:

- Embankment along Muhuri river by Bangladesh government raises concerns of flood in Tripura.
- It is a transnational river that flows in India and Bangladesh.
- Rising in Lushai hills of Tripura, it flows into Bangladesh where it merges with the Feni river near the latter's mouth to the Bay of Bengal.
- It is also known as the Little Feni.
- It acts as part of the border between India and Bangladesh in the Tripura-Noakhali sector.
- However, frequently changing course of river prevented the two nations from demarcating boundary here.
- Muhurichar river island is a 140-acre island on river and important for rice cultivation.

(TH)

### PRACTICE MCQS

**Q1.** Consider the following statements about the Commission of Railway Safety:

1. It deals with matters pertaining to safety of rail travel and train operation.
2. It works under administrative control of Ministry of Railways.
3. Its headquarter is in New Delhi.

Which of the statements given above is/are incorrect?

- a) 1 only
- b) 2 only
- c) 1 and 3 only
- d) 2 and 3 only

**Answer: D**

**Q2.** Which of the following statements about the Exercise 'Desert Flag' is correct?

- a) It is a multinational military combat exercise hosted by the Saudi Arabia.
- b) It is a multinational air combat exercise hosted by the UAE Air Force.
- c) It is a bilateral air combat exercise between India and Saudi Arabia.
- d) It is a bilateral military exercise between India and the UAE.

**Answer: B**

**Q3.** It is a specialized facility that accelerates the design, construction, and testing of biological systems using automated tools and high-throughput technologies. It integrates various processes like DNA synthesis, gene editing, and strain engineering into a streamlined workflow.

Which of the following is correctly described in the above paragraph?

- a) Biomanufacturing
- b) Biofoundry
- c) Biosynthesis
- d) Bioassay

**Answer: B**

**Q4.** The continent of Europe is warming twice faster than overall world average. Which of the following are considered as reasons for this?

1. Arctic amplification
2. Reduced aerosols in atmosphere above Europe
3. Urban Heat Island effect
4. Increase in the albedo of landscape

Select the correct answer using the code given below:

- a) 1 and 3 only
- b) 1, 2 and 3 only

- c) 3 and 4 only
- d) All of them

**Answer: B**

**Q5.** Consider the following statements about the Muhuri River:

- 1. It is a transnational river that flows in India and Bangladesh.

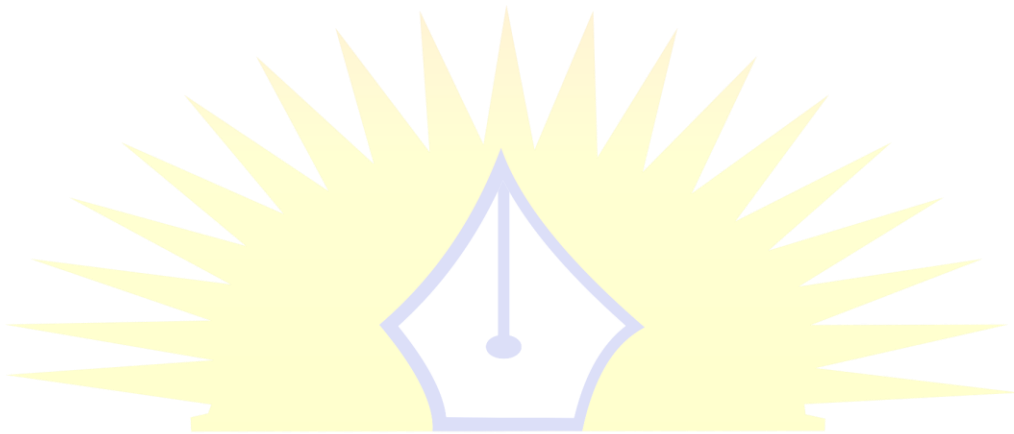
- 2. It rises in Lushai hills of Tripura and flows into the Feni River in Bangladesh.

Which of the statements given above is/are correct?

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

**Answer: C**

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