

PRELIMS MANTRA – 7 (20/02/2025)

- **Mullaperiyar dam:** It is masonry gravity dam situated at **confluence of Mullayar and Periyar rivers** in Idukki district (Cardamom Hills), Kerala but operated and maintained by Tamil Nadu. It is 155 ft high and 1200 ft long. Diverted water is used to **feed Vaigai River basin (arid areas of Tamil Nadu)**. Periyar National Park & Tiger Reserve is located around dam's reservoir. **As per Dam Safety Act 2021, National Dam Safety Authority (NDSA) will perform role of State Dam Safety Organisation for a dam located in one State and used by another.** NDSA is set up under Act to implement policies and address unresolved issues between two States while **National Committee on Dam Safety (NCDS)** to evolve dam safety policies and recommend necessary regulations.
- **Manipur has 33 recognised Scheduled Tribes**, most falling into the Naga and Kuki (now Kuki-Zo) groupings. There are also the majority Meiteis (and **Pangals or Meitei Muslims**) who are considered non-tribals.
- **Coalition for Disaster Resilient Infrastructure (CDRI):** It was **established in 2019 at UN Climate Action Summit under India's leadership** and with support of UN Office for Disaster Risk Reduction (UNDRR). It is a **multi-stakeholder global coalition** of nations, UN organisations, multilateral development banks, corporate sector, and academic institutions. Governing authority of CDRI is divided into three groups: Governing Council, Executive Committee and Secretariat. Secretariat is in New Delhi, India. **Flagship reports - Global Infrastructure Resilience Report.**

Upcoming Airports in Bihar:

- Raxaul Brownfield Airport
- Birpur Airport (Sapaul) under UDAN Scheme
- Rajgir Greenfield Airport
- Bhagalpur Greenfield Airport

Initiatives by CDRI:

- **Infrastructure Resilience Academic eXchange (IRAX):** It bridges the talent gap for building disaster-resilient infrastructure.
- **Infrastructure for Resilient Island States:** To strengthen critical infrastructure in Small Island Developing States (SIDS).
- **CDRI WORLD knowledge portal:** It acts as a central repository for resources, tools, and best practices related to disaster-resilient infrastructure.
- **Infrastructure Resilience Accelerator Fund (IRAF):** Provides support to developing & small island nations.
- **CDRI Technical Resource Handbook:** It provides practical guidance on assessing infrastructure vulnerabilities and implementing resilience measures
- **DRI Connect:** It is a one-stop online space for DRI stakeholders to connect, learn and collaborate towards improved practices, processes and policies for resilient infrastructure systems.

Animals using polarised sunlight and moonlight:

- **When light moves through earth's atmosphere, it is scattered by particles in air and becomes polarised.** Polarisation denotes a specific orientation of electric field. Seen from ground, **both sunlight and moonlight contain characteristic polarisation patterns.** An unusual pattern emerges in sky when seen through a filter that can detect polarised light. This is called the **e-vector pattern.** The way these patterns are oriented in sky allows animals to use it as a compass. **Recent study found nocturnal bull ants were able to detect and use polarised moonlight throughout the lunar cycle for foraging. First animal found to use polarised moonlight was the dung beetle.**
- **African dung beetle (Scarabaeus zambesianus)** collects elephant dung that it forms into balls in which to raise and feed its young. It then rolls these balls away from dung pile to avoid competition from other beetles. Most efficient way out is along a straight line. When the Sun and its polarisation pattern (not visible to humans) is unavailable after twilight, dung beetles use much dimmer polarisation pattern around Moon to maintain this straight escape line – but this is much more effective under a full moon. On dark nights around a new Moon, beetles are unable to maintain straight paths and moved in meandering tracks.
- **Stanene:** Like graphene, a one-atom layer of bonded carbon atoms, **stanene is a layer of tin atoms.** This sheet is of interest to materials scientists because **it's expected to be a topological insulator.**
- **Aerogels:** These are among lightest solid materials known to man. They are created by combining a polymer with a solvent to form a gel and then removing liquid from gel and replacing it with air (more than 99% of its composition by volume is air). Aerogels are extremely porous and very low in density. They are solid to touch. This translucent material is considered one of finest **insulation materials** available. Aerogels have **primarily been made of silica.** Silica is combined with a solvent to create a gel. This gel is then subjected to **supercritical fluid extraction.** This supercritical fluid extraction involves introducing liquid carbon dioxide into gel.
- **Lake Kivu:** One of the great lakes of East Africa, situated between Congo (Kinshasa) to west and Rwanda to east (58% of its waters are lying in DRC; rest are situated in Rwanda). It is Rwanda's largest lake and sixth largest in Africa. It contains numerous islands, largest of which is Idjwi. Volcanic outpourings along its northern shore created a dam that separated Kivu from Lake Edward (Lake Idi Amin Dada), barred Kivu's northern outflow, and **reversed its drainage to south through Ruzizi (Rusizi) River into Lake Tanganyika.** Kivu's shores are densely populated, **principal towns being Bukavu and Goma in Congo (in news due**

to M23 rebels) and Gisenyi (Kisenyi) in Rwanda. Great volumes of dissolved methane gases that may be developed as energy sources exist in its deep waters.

- **India elected to Vice Presidency of International Organization of Aids to Marine Navigation (IALA) in Singapore.** IALA, established in 1957 as an NGO, transitioned to an inter-governmental organization (IGO) to enhance its role in shaping international standards and best practices for safe and efficient navigation. India is hosting the IALA Council meeting in December 2025 and the IALA Conference & General Assembly in September 2027 in Mumbai.
- **World Day of Social Justice, observed annually on February 20th by the United Nations,** serves as a global call to action for addressing poverty, exclusion, and unemployment while promoting solidarity, harmony, and equality of opportunity within and between societies.

Pradhan Mantri Anusuchit Jaati Abhyuday Yojana (PM-AJAY):

- Scheme **launched in 2021-22**, merges three schemes to uplift SC communities through skill development, income generation, and infrastructure in Schedule Caste dominated villages.
- It has **three components:** Adarsh Gram development, Grants-in-Aid for socio-economic projects, and hostel construction in higher education institutions.

Scheme for Residential Education for Students in High Schools in Targeted Areas (SRESHTA):

- It aims to bridge service gaps in Schedule Caste dominant areas by supporting **grant-in-aid institutions and high-quality residential schools.**
- It provides financial assistance to top CBSE/State Board-affiliated private schools for SC students in classes 9 and 11, ensuring education till class 12.
- Additionally, it funds NGOs/VOs to run residential and non-residential schools and hostels with adequate infrastructure and strong academic standards, fostering socio-economic upliftment of SC communities.

National Action for Mechanised Sanitation Ecosystem (NAMASTE):

- It is a **Central Sector Scheme launched in FY 2023-24** as a **joint initiative of the Ministry of Social Justice & Empowerment (MoSJ&E) and the Ministry of Housing and Urban Affairs (MoHUA).**
- It aims to ensure the **safety, dignity, and sustainable livelihood of sanitation workers** in urban India.
- The scheme has integrated components of the former Self-Employment Scheme for Rehabilitation of Manual Scavengers (SRMS) and expanded its coverage to include waste pickers as a target group from FY 2024-25.

Support for Marginalized Individuals for Livelihood & Enterprise (SMILE):

- It is a comprehensive initiative **aimed at the rehabilitation of transgender individuals and persons engaged in begging.**
- Its primary objective is to create a 'Bhiksha Vritti Mukta Bharat' (Begging-free India) by ensuring the reintegration of beggars into mainstream society.
- The scheme focuses on area-specific surveys, awareness campaigns, mobilization and rescue operations, access to shelter homes and basic services, skills training, alternative livelihood options, and the formation of Self-Help Groups (SHGs).

PRACTICE MCQs

Q1. Consider the following statements about Lake Kivu:

1. It is situated between Democratic Republic of Congo to the west and Rwanda to the east.
2. It drains into Lake Tanganyika situated to the north.
3. It has great volumes of dissolved methane gases which could be used as source of energy in future.

Which of the statements given above is/are correct?

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

Answer: D

Q2. Consider the following statements about Coalition for Disaster Resilient Infrastructure:

1. It was established in 2019 at UN Climate Action Summit under India's leadership.
2. It is an inter-governmental organisation with headquarter in New Delhi.
3. It releases Global Infrastructure Resilience Report.

How many statements given above are correct?

- a) Only one
- b) Only two
- c) All three
- d) None

Answer: B

Q3. Like graphene, a one-atom layer of bonded carbon atoms, stanene is a layer of atoms of –

- a) Tungsten
- b) Tin
- c) Copper
- d) Silicon

Answer: B

Q4. These are among lightest solid materials known to man. They are created by combining a polymer with a solvent. More than 99% of its composition by volume is air. They are extremely porous and very low in density. They make finest insulation materials.

Which of the following materials is described in above paragraph?

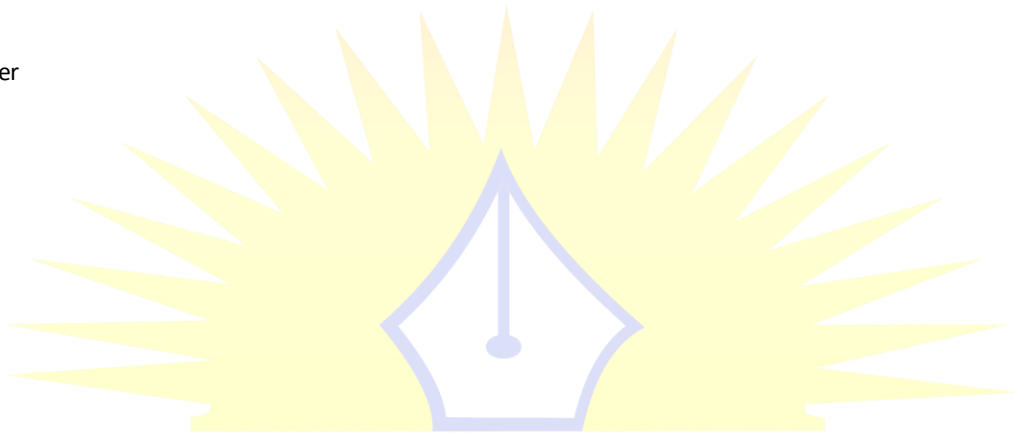
- a) Aerogel
- b) Hydrogel
- c) Organogel
- d) Colloidal gel

Answer: A

Q5. Which of the following animals are known to detect and use polarised moonlight for foraging at night?

- a) Dung beetle
- b) Crabs
- c) Tortoise
- d) Polar bear

Answer: A



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