Prelim Bits 01-04-2023 | UPSC Daily Current Affairs

Supercapacitors

Indian Institute of Science (IISc) researchers have designed a novel ultramicro supercapacitor, capable of storing an enormous amount of electric charge.

- **Energy storage devices -** Batteries that currently power most of these devices lose storing ability over time.
- Capacitors, while storing electric charge for much longer, cannot discharge energy constantly.
- Supercapacitors overcomes these shortfalls by combining the properties of capacitors and batteries into one device.
- **Supercapacitors** - Supercapacitors are electronic devices which are used to store extremely large amounts of electrical charge.
- Supercapacitors are also known as double-layered capacitor or ultracapacitor.
- Supercapacitors come with capabilities to store and release large amounts of energy, making them highly sought-after for next-generation electronic devices
- The novel ultra-micro supercapacitor is smaller and more compact than existing supercapacitors.
- They can potentially be used in devices ranging from streetlights to consumer electronics, electric cars and medical devices.

References

1. The Hindu - IISc researchers design compact supercapacitor
2. Deccan Herald - IISc's new micro supercapacitor

Classes of Solar Flare

The Sun sent out a powerful 'X-class' solar flare on March 29, 2023 which was classified as an X1.2 flare.

- The X1.2 flare erupted from sunspot AR3256 near the south-western limb of the star in our Solar System.
- This solar flare led to a strong shortwave radio blackout over south-east Asia, Australia, and New Zealand.
- **Solar Flare -** A solar flare is an intense burst of radiation coming from the release of magnetic energy associated with sunspots.
- They are seen as bright areas on the sun and they can last from minutes to hours.
- There are 4 classes of solar flares - ***B, C, M and X***.
- Solar flares are classified on a logarithmic scale similar to the Richter scale.
- This means that a C-class storm is 10 times more powerful than a B-class storm and so on.

- The class denotes the strength of the flare and the number that comes after it signifies their strength at a finer scale.
- Each class is therefore divided into 9 subdivisions.
- For example, X1 to X9.
- Flares and solar eruptions can impact radio communications, electric power grids, and navigation signals, and pose risks to spacecraft and astronauts.
- X-class flares can trigger planet-wide radio blackouts and long-lasting radiation storms.

References

1. IE - Powerful 'X-class' solar flare slams Earth, causes radio blackouts
2. NASA - Strong Solar Flare Erupts from Sun
3. India Today - Powerful flare from Sun hits Earth

Moon to Mars Program Office

NASA has set up a new Moon to Mars Program Office at its headquarters in Washington.

- The Moon to Mars Program Office will help prepare NASA's human spaceflight missions to the Moon and beyond.
- The office will also help NASA to set up a long-term presence of human on the Moon.
- The office will focus on hardware development, mission integration, and risk management for programs that will be critical to NASA's space exploration approach.
- It will also lead the planning and analysis for developments to support human Mars mission.
- **New Head -** Amit Kshatriya will serve as the agency's first head of the new office.
- He earlier served as acting deputy associate administrator for the agency's Common Exploration Development.

NASA aims to send astronauts to Mars by the late 2030s or early 2040s.

References

1. IE - NASA sets up new office to help land humans on Mars
2. IE - Amit Kshatriya is the head of new Moon to Mars Program Office
3. NASA - New Program Office Leads NASA's Path Forward for Moon, Mars

National Company Law Appellate Tribunal (NCLAT)

The National Company Law Appellate Tribunal (NCLAT) has upheld a penalty imposed by Competition Commission of India (CCI) on Google, for its anti-competitive conduct in the Android ecosystem.

- *Click here to know about Google vs CCI issue*
- **NCLAT -** National Company Law Appellate Tribunal (NCLAT) is an appellate tribunal constituted in 2016.
- NCLAT was constituted by central government under the Companies Act, 2013.

- NCLAT has one Principal Bench at New Delhi and 15 other Benches at different locations.
- NCLAT is an appellate tribunal for hearing appeals against
    1. the orders of National Company Law Tribunal(s) (NCLT)
    2. the orders passed by Insolvency and Bankruptcy Board of India
    3. any direction issued or decision made or order passed by the Competition Commission of India (CCI)
    4. the orders of the National Financial Reporting Authority

About 97% of the 600 million smartphones in India run on Android, according to Counterpoint Research estimates.

References

1. IE - NCLAT upholds Rs 1,337 crore penalty on Google
2. National Company Law Appellate Tribunal

Tajikistan and Azerbaijan declared Malaria free

The World Health Organization (WHO) has certified Azerbaijan and Tajikistan as malaria-free.

- In the latest announcement, the WHO officially declared 41 countries and one territory, including 21 countries in the European Region, malaria-free.
- Azerbaijan and Tajikistan were certified as malaria-free for eliminating the Anopheles mosquito-borne disease in their territories.
- In Tajikistan and Azerbaijan, the last cases of regional spread of *Plasmodium vivax* malaria were discovered in 2012 and 2014, respectively.
- **Certification -** Certification of malaria elimination is the official recognition by WHO of a country's malaria-free status.
- WHO grants this certification when
    - A country has proven that the chain of local transmission by *Anopheles* mosquitoes has been interrupted nationwide for at least the past 3 consecutive years.
    - A country must also demonstrate the capacity to prevent the re-establishment of transmission.
- A fully functional surveillance and response system that can prevent re-establishment of indigenous transmission is in place.

Malaria

Parasite	Malaria is a disease caused by a Plasmodium parasite
Vector	It is usually transmitted by the bite of infected female Anopheles mosquitoes.
Severity	The severity of malaria varies based on the species of Plasmodium - *Plasmodium falciparum* and *Plasmodium vivax* are fatal.

Symptoms	Symptoms of the disease includes chills, fever and sweating, usually occurring a few weeks after being bitten.
Treatment	It is both preventable and curable.
Vaccine	***Mosquirix*** is the first and to date only vaccine shown to have the capability of significantly reducing malaria.
Measures & initiatives India	• National Malaria Eradication Programme (NMEP) - 1958 • National Vector Borne Disease Control Programme (NVBDCP) - 2003 • National Framework for Malaria Elimination in India 2016–2030

References

1. Down To Earth - Azerbaijan, Tajikistan reach malaria-free milestone
2. WHO - WHO certifies Azerbaijan and Tajikistan as malaria-free

SHANKAR IAS PARLIAMENT
Information is Empowering