

Small Cells

❖ Context

- To expedite the roll-out of 5G, telecom operators in the country will deploy low-power base stations called 'small cells'.



❖ What are Small Cells?



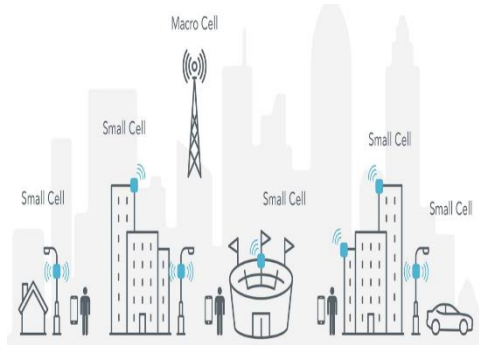
- Small cells are **low-powered radio access nodes or base stations** that have a coverage range from a **few metres up to a few hundred metres**.

- They are portable, easy to deploy and help provide localised coverage.
- Companies will leverage **street furniture** such as poles, advertisement hoardings and bus shelters for deployment.

❖ Why do Companies Need them?

- Small cells are needed for deploying 5G as opposed to earlier generations such as 4G, because of the **frequency**.
- The **higher the frequency, the lower the wavelength, which means that the distance they travel is less**.
- Higher frequencies in the range of 3.3-3.6 GHz are expected to be used for offering 5G services. 5G waves will travel **100-150 metres**. At present, telecom towers (**Macrocells**), which are about 30 metres high, are placed at a distance of about 5 km apart.

❖ Right of Way Rules



- The Department of Telecom has also recently notified the amended Right of Way Rules, which pave the way for deployment of 5G small cells on existing street infrastructure.

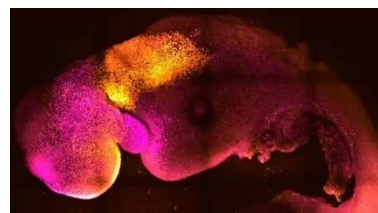
❖ Types of Small Cells

- **Femtocells** : These devices are similar to wireless routers with a typical **maximum range of 10 m**. Femtocells can only accommodate a few users at a time and are usually deployed indoors.
- **Picocells** : Boasting a more extensive **range of up to 200 m**, picocells can support a maximum of 100 users and are typically installed in larger indoor areas, such as hospitals, airports and train stations.
- **Microcells** : These are the most potent type of small cell and have a **range of up to 2 km**. Microcells are usually attached to traffic lights and street signs.

Synthetic Embryo

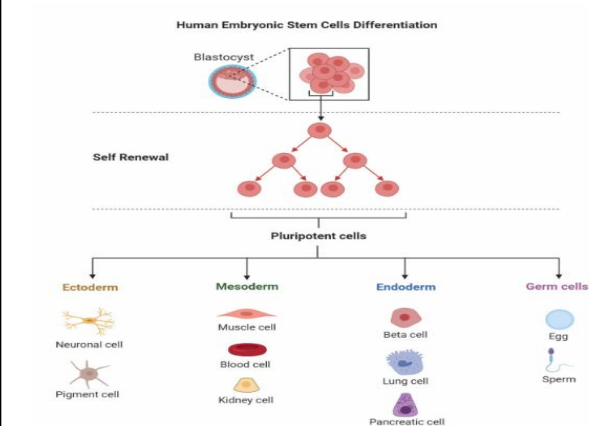
❖ Context

- Researchers at Cambridge have created model embryos from mouse stem cells, without using eggs or sperm.



❖ Key Highlights

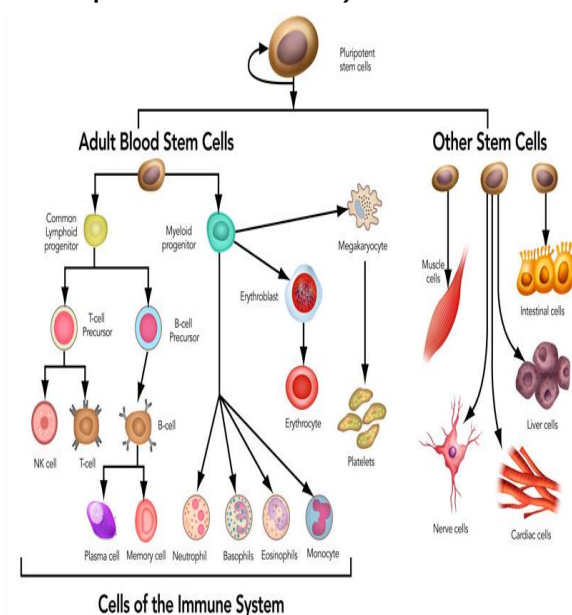
- The developed embryo had a **brain, a beating heart**, and the foundations of all the other organs of the body.
- To guide the development of their synthetic embryo, the researchers put together **cultured stem cells** representing each of the three types of tissue (**embryonic, trophoblast and extraembryonic**) in the right proportions and environment to promote their growth and communication with each other, eventually self-assembling into an embryo.
- Growing cells in the laboratory is known as "**cell culture**." Stem cells can proliferate in laboratory environments in a culture dish that contains a nutrient broth known as **culture medium** (which is optimised for growing different types of stem cells).



- Scientists hope that their study will help to understand why some embryos fail to develop. Additionally, the results could be used to guide the repair and development of synthetic human organs for transplantation.

❖ About Stem Cells

- Stem cells are the **foundation** for every organ and tissue in the human body.
- All stem cells can self-renew (make copies of themselves) and differentiate (develop into more specialised cells).



- These include **embryonic stem cells** that exist only at the earliest stages of development and various types of **tissue-specific (or adult) stem cells** that appear during foetal development and remain in bodies throughout life.

- **Induced pluripotent stem (iPS) cells** are cells that have been engineered in the lab by converting tissue-specific cells, such as skin cells, into cells that behave like embryonic stem cells.

Face to Face Centres



30 August, 2022

Malvinas Islands

❖ Context

- India recently reiterated support for international negotiations regarding a territorial matter between Argentina and the United Kingdom in the Southern Atlantic Ocean.



❖ Key Highlights

- The **Falkland Islands** is an archipelago in the South Atlantic Ocean on the Patagonian Shelf.
- The principal islands are about 300 mi (480 km) east of South America's southern Patagonian coast and about 752 mi (1,210 km) from the northern tip of the Antarctic Peninsula, at a latitude of about 52°S.
- The archipelago, with an area of 4,700 sq mi (12,000 km²), comprises East Falkland, West Falkland, & **776 smaller islands**.
- As a British overseas territory, the Falklands have internal self-governance, and the United Kingdom takes responsibility for their defence and foreign affairs.
- The capital & largest settlement is Stanley on East Falkland.

- Controversy exists over the Falklands' discovery and subsequent colonisation by Europeans.



- At various times, the islands have had French, British, Spanish, and Argentine settlements. Britain reasserted its rule in 1833, but Argentina maintains its claim to the islands.
- The territory's sovereignty status is part of an ongoing dispute between Argentina and the United Kingdom.

Khula : Instant Divorce

❖ Context

- Recent data from the Darul Qazas (Islamic arbitration centres) show that an increasingly larger number of women are opting to end their marriage through **khula**.



❖ Key Highlights

WOMEN BEAR BRUNT

- Fearing **jail** if they utter **triple talaq**, men intending to divorce their wives seek '**khula**'
- '**Khula**' granted on the **woman's request**, so the man cannot be held **responsible** for the instant divorce
- Waqf boards **warn qazis** not to **hurry** through the '**khula**' requests
- Religious scholars **blame** the Muslim Women (Protection of Rights on Marriage) Act, 2019 for the **jump** in '**khulas**'

In the case of khula, it's the woman who initiates divorce, and surrenders her **mehr** (wealth transferred or promised to the woman at the time of marriage) at the time of such a divorce.

- Khula can be effected orally or through a document called the '**Khulnama**'.
- It has the effect of an instant divorce.

- If the mehr had not been given to the woman by the time she opted for khula, she cannot demand the mehr as the marriage is being called off at her behest.
- There's another provision in Islamic jurisprudence to annul the marriage - **Mubarat** - which is a form of divorce proposed by both the parties and they decide mutually to put an end to their marital relationship.
- In 2020-21, all Darul Qazas received nearly 5,000 cases of Khula and data show a similar rising trend in Delhi and Mumbai.

UN Nuclear Treaty

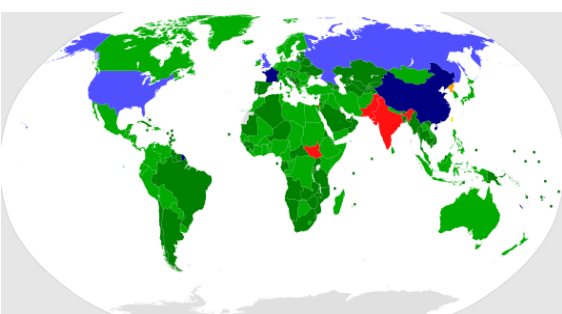
❖ Context

- A month-long meeting on nuclear disarmament ended in failure at the United Nations recently when Russia refused to accept the final draft of the Treaty on the Non-Proliferation of Nuclear Weapons.



❖ Non-Proliferation of Nuclear Weapons

- The NPT is a landmark international treaty whose objective is to prevent the spread of nuclear weapons and weapons technology, to promote cooperation in the peaceful uses of nuclear energy and to further the goal of achieving nuclear disarmament and general and complete disarmament.



- The Treaty represents the only binding commitment in a multilateral treaty to the goal of disarmament by the nuclear-weapon States.

- Opened for signature in 1968, the Treaty entered into force in 1970. On 11 May 1995, the Treaty was extended indefinitely.
- A total of 191 States have joined the Treaty, including the five nuclear-weapon States. More countries have ratified the NPT than any other arms limitation and disarmament agreement, a testament to the Treaty's significance.
- To further the goal of non-proliferation and as a confidence-building measure between States parties, the Treaty establishes a safeguards system under the responsibility of the **International Atomic Energy Agency (IAEA)**.

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30 August, 2022

Artemis-1

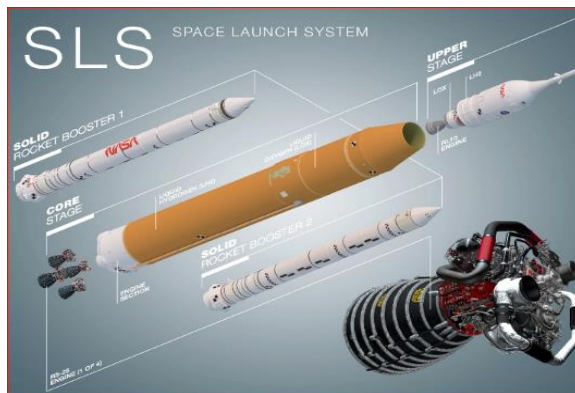
❖ Context

- The **National Aeronautics and Space Administration (NASA)** Artemis 1 moon mission was postponed after the crew could not get the rocket's engines to the proper temperature range required to start the engines at lift-off.



❖ Key Highlights

- NASA's Artemis 1 mission is aimed at **EXPLORING THE MOON** with the specific objective of getting human beings back on the lunar surface and possibly beyond to Mars and elsewhere.
- It is the first in a series of ambitious missions that are planned to take human beings back to the Moon, explore possibilities of extended stay there & investigate the potential to use it as a launch pad for deep space explorations.



- It is technically only a lunar Orbiter mission.
- It is not carrying any astronauts.
- It does not even have a lander or rover component.
- The mission's spacecraft, called Orion, will get into a lunar orbit that would be about **97 km** from the Moon's surface at its closest.
- But unlike most other Orbiter missions, Orion has a return-to-Earth target after it has orbited the Moon for about a month.

News in Between the Lines

Amendments in the Supreme Court Judge Rules

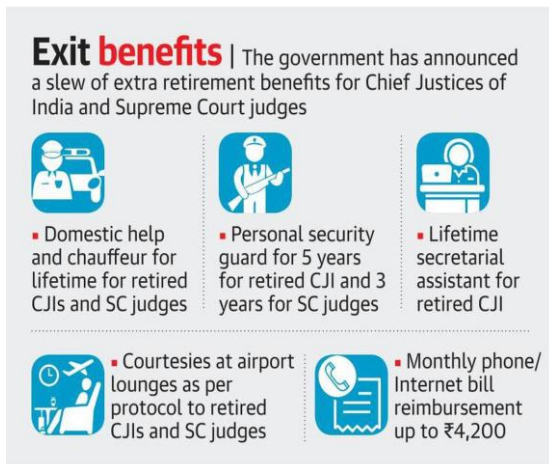


❖ Context

- The Centre's amended rules allowing lifetime staff for retired Chief Justices of India and Supreme Court judges.

❖ Key Highlights

- In the rules, former CJIs were given ₹70,000 and former judges ₹39,000 every month.
- The money was used by them to employ personal staff of their individual choice.
- However, instead of the monthly payment now, the new rules restrict retired judges to choose their staff from among the top court or High Court employees.
- According to the new rules, the domestic help would be equivalent to the level of a junior court assistant, the chauffeur would rank equal to his counterpart in the Supreme Court & the secretarial assistant would be equivalent to the level of a branch officer in the Supreme Court.
- The courts would pay their salaries.
- The pay & allowances would be that of a regular employee of the Supreme Court.



Delhi Special Police Establishment (DSPE) Act



❖ Context

- Leaders of the ruling 'Mahagathbandhan' in Bihar recently called for withdrawing the general consent to the CBI, alleging that the agency was being misused for political purposes.

❖ Key Highlights

- According to **Section 6** of the DSPE Act, 1946, the CBI needs consent from the respective state governments for conducting investigations in their jurisdictions.
- Nine states, including West Bengal, Chhattisgarh, Rajasthan, Punjab and Meghalaya, have withdrawn general consent for the Central Bureau of Investigation (CBI) to probe cases in their jurisdiction.

❖ Context

- NASA's Perseverance Mars rover recently discovered **volcanic rocks** in Jezero Crater.

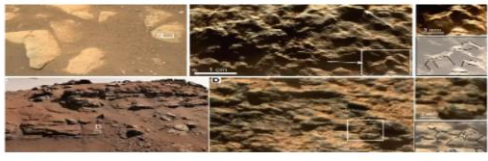
❖ Key Highlights

- Many of the rocks are **dark green** in nature. They're very **like igneous rocks on Earth early in its existence**, unlike those that exist today.

Jezero Crater

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- The planet was expected to have sedimentary rocks which could have been washed in by rivers and accumulated on the lake bottom.
- The discovery could unlock the **climate history** of Mars. It will help in revealing when exactly the red planet was potentially habitable.

Sampoorna Project



❖ Context

- Mentioned by PM in Mann ki Baat, calling for active participation of masses during Poshan maah which is celebrated every year during September.

❖ Key Highlights

- Being run in **Assam's Bongai village**. A unique method employed to fight malnutrition. The mother of a healthy child from an Anganwadi centre meets the mother of a malnourished child every week & discusses all the nutrition related information. **Under Poshan Abhiyaan, girls aged between 14 and 18 years have also been included, in all the Aspirational districts and NE states.**

Mobile Banking Trojans



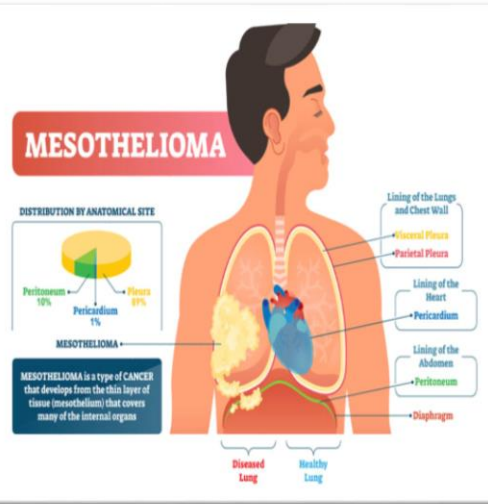
❖ Context

- Global cybersecurity firm Kaspersky warns of an increase in cyberattacks on Android and iOS devices in the Asia Pacific (APAC) as more people switch to mobile banking in the region.

❖ Key Highlights

- Mobile banking Trojans are **dangerous malware** that can steal money from mobile users' bank accounts by **disguising the malicious application as a legitimate app** to lure unsuspecting people into installing the malware.
- Two prominent malware campaigns operate in the region and target smartphone users in several countries - **Anubis and Roaming Mantis**.
- Anubis has been targeting Android users since 2017. The group targets users by sending **smishing** (phishing messages sent through SMS) texts with a short description and a URL landing page.

Mesothelioma



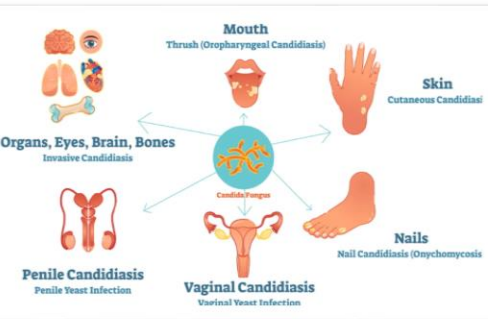
❖ Context

- **Talcum powders** are considered harmful for both the mother and baby.

❖ Key Highlights

- When talc is contaminated with asbestos, it is more likely to contain highly carcinogenic **tremolite or anthophyllite**. They are considered more carcinogenic than **chrysotile**, the most-used type of asbestos.
- **Prolonged breathing** of asbestos increases the risk of multiple cancers, including **lung & colon cancer. Infants and children below the age of five are five times more likely** to get affected than a 30-year-old adult to develop mesothelioma, as a child's organs are more tender than an adult's. **Mesothelioma** is a type of cancer that develops from the thin layer of tissue that covers many of the internal organs (known as the mesothelium).
- The most common area affected is the **lining of the lungs and chest wall**.
- More than 80% of mesothelioma cases are caused by exposure to asbestos.

Candidiasis



❖ Context

- Indian scientists have identified a new gene, **CSA6**, that can hold the key to prevent fungal infection Candidiasis.

❖ Key Highlights

- The gene has been identified in **Candida albicans**, a **yeast fungal species** infamous for causing high rates of morbidity and mortality.
- The fungal species resides in **mucosal linings of the gastrointestinal & urogenital tract** of healthy individuals. It turns into a pathogen under **immuno-compromised conditions**, i.e. when immune defences are low, causing life threatening systemic infections.
- The disease often affects **intensive-care unit (ICU) patients, cancer patients and patients receiving immunosuppressive therapy**.



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