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Topic 1. G7 MINISTERS COMMIT TO MOVE TO CARBON-FREE POWER BY 2035

Important for the subject: Environment

A proposal to have a 2030 deadline for phasing out coal was shot down and the final text gives leeway for continued investment in gas, on the grounds that it could be a stopgap against energy shortfalls.

- Climate and Energy Ministers and envoys from Group of Seven (G7) countries **committed to work towards ensuring carbon-free electricity** production by 2035 and **"accelerating" the phase-out of coal**. This was part of an agreement by the countries at the end of a two-day conference in **Sapporo, Japan**, ahead of the **G7 summit in Hiroshima this May.**

- A proposal to have a 2030 deadline for phasing out coal was shot down and the final text gives leeway for continued investment in gas, on the grounds that it could be a stopgap against energy shortfalls, Reuters reported.

- At the **United Nations-Conference of Parties** (COP) meeting in Glasgow in 2021, India had **objected to language in the agreement to "phase out"** and pushed **instead for a "phase down" of coal**.

- At the COP meeting in Sharm el Sheikh last year, **India pushed for a proposal to phase out all fossil fuel sources, including coal and gas**. India and China are significantly dependent on coal for electricity, whereas several developed countries, including the **United States, Japan, Canada and Europe are reliant on gas reserves.** The latter however **didn't find mention in the final text of the Sharmel Sheikh agreement**.

- The G7 nations account **for 40% of the world's economic activity** and a **quarter of global carbon emissions.** Their actions are critical, but so is their **support for less wealthy nations often suffering the worst effects of climate change** while having the fewest resources for mitigating such impacts.

- Emissions in advanced economies are falling, though historically they have been higher — the **United States alone accounts for about a quarter of historic global carbon emissions** — while **emerging markets and developing economies now account for more than two-thirds** of global carbon emissions

- The president-designate for the next United Nations climate talks, the COP28, who was

also attending the talks in Sapporo, issued a statement **urging G7 nations to increase financial support for developing countries' transitions to clean energy**.

Topic 2. RHINO POACHING SUSPECT'S BODY FOUND IN RIVER; POLICE SAY HE JUMPED IN TO ESCAPE

Important for the subject: Environment

Three weeks after Assam's first rhino poaching case in more than a year was discovered in Kaziranga, the body of the suspected poacher was found floating in the Brahmaputra on Sunday.

It is located in the State of Assam and covers 42,996 Hectare (ha). It is the single largest undisturbed and representative area in the Brahmaputra Valley floodplain.

Status of the National park:

- It was declared as a National Park in 1974. It has been declared a tiger reserve since 2007. It has a total tiger reserve area of 1,030 sq km with a core area of 430 sq. km.
- It was declared a **UNESCO World Heritage Site** in 1985. It is recognized as an **Important Bird Area by Bird Life International**.

Important Species Found:

- It is the **home of the world's most one-horned rhinos**. Pobitora Wildlife Sanctuary has the highest density of one-horned rhinos in the world and second highest number of Rhinos in Assam after Kaziranga National Park.
- Much of the focus of conservation efforts in Kaziranga are focused on the 'big four' species— Rhino, Elephant, Royal Bengal tiger and Asiatic water buffalo. Kaziranga is also home to 9 of the 14 species of primates found in the Indian subcontinent.

Rivers and Highways:

- The National Highway 37 passes through the park area. The park also has more than 250 seasonal water bodies, besides the Diphlu River running through it.

Other national parks in Assam are:

- Dibru Saikhowa National Park, Manas National Park, Nameri National Park, Rajiv

Gandhi Orang National Park.

- Rhinos are listed in **Schedule 1 of Wildlife (Protection) Act, 1972** as an endangered animal and there is an international ban on trade of rhino horns under **CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna).**

- Three species of rhino—**black, Javan, and Sumatran**—are critically endangered. Today, a small population of Javan rhinos is found in only one national park on the northern tip of the Indonesian island of Java.

- A mainland subspecies of the Javan rhino was declared extinct in Vietnam in 2011. Successful conservation efforts have led to an increase in the number of greater one-horned (or Indian) rhinos, from around 200 at the turn of the 20th century to around 3,700 today.

Indian Rhino Vision 2020

- Launched in 2005, Indian Rhino Vision 2020 is an ambitious effort to attain a wild population of at least 3,000 greater one-horned rhinos spread over seven protected areas in the Indian state of Assam by the year 2020.

- Seven protected areas are Kaziranga, Pobitora, Orang National Park, Manas National Park, Laokhowa wildlife sanctuary, Burachapori wildlife sanctuary and DibruSaikhowa wildlife sanctuary.

- It is a collaborative effort between various organizations, including the International Rhino Foundation, Assam's Forest Department, Bodoland Territorial Council, World Wide Fund – India, and the US Fish and Wildlife Service.

Topic 3. WILD WATER BUFFALOES

Important for the subject: Environment

The love for momos in Nepal is threatening endangered wild water buffaloes Dumplings (momos) filled with buffalo meat are popular in Nepal. They command a higher price if the **meat comes from a crossbreed of wild and domestic buffalo**.

Crossbreeding domestic and endangered wild buffaloes is **illegal and can threaten the wild populatio**n, but people do it **because of the high demand** for the meat as well as a belief that crossbred females produce more milk. People from India too sometimes leave their domestic

water buffaloes out in the open near the **KoshiTappu Wildlife Reserve** in eastern Nepal, the country's last remaining habitat for wild buffaloes, with the hope of crossbreeding with wild buffaloes. Authorities in **the KoshiTappu Wildlife Reserve** are **challenged with controlling the mixing of wild and domestic animals inside the reserve**.

Wild Water Buffaloes:

- Wild water buffaloes, also known as Asiatic water buffaloes, are **large bovine animals that are native to the Indian subcontinent** and Southeast Asia. They are one of the two species of buffalo that exist, the other being the domesticated water buffalo. Wild water buffaloes **prefer swampy and marshy habitats**, such as grasslands, reed beds, and forests, near rivers, lakes, and other water bodies.

- They are typically found in areas with **warm and humid climates**, including India, Nepal, Bhutan, Bangladesh, and Southeast Asia. In India, wild water buffaloes are **found in the northeastern states of Assam, Arunachal Pradesh, and Meghalaya.**

- Wild water buffaloes are **large and stocky animals** that can weigh up to 1200 kg. They have a **dark brown or black coat** that is coarse and sparse, with tufts of hair on their head and neck. They also have large, **curved horns that can span up to 2 meters**. Wild water buffaloes are **excellent swimmers and can move easily through water**.

- Wild water buffaloes are **social animals** that live in herds of up to 30 individuals, typically **led by a dominant male.** They are mostly active at dawn and dusk and spend most of their day resting and feeding. They are **herbivores** and primarily feed on grasses, aquatic plants, and other vegetation. Wild water buffaloes are also known to wallow in mud and water, which helps them regulate their body temperature and avoid parasites.

- **Threats**: Wild water buffaloes are threatened by h**abitat loss and fragmentation due to human activities**, such as agriculture, infrastructure development, and logging. They are also at **risk of poaching** for their meat, horns, and other body parts. In addition, they are **vulnerable to diseases**, such as bovine tuberculosis and foot-and-mouth disease, which can be **transmitted by domestic cattle**.

- The population of wild water buffaloes in India is estimated to be around 3,400 individuals, with the **majority of them living in Assam.** The wild water buffalo **is listed as endangered on the IUCN Red List.**

- **Conservation**: Several conservation programs are in place to protect wild water buffaloes, including the Indian **Wildlife Protection Act**, which **prohibits hunting and trade of**

wild water buffaloes and their products. **International Union for Conservation of Nature (IUCN) and the Wildlife Conservation Society (WCS)**, are working to establish protected areas and captive breeding programs for wild water buffaloes.

Topic 4. MANGROVE PITTA BIRDS

Important for the subject: Environment

First-ever census finds 179 mangrove pitta birds in two coastal Odisha districts. Mangrove pitta birds are a nearly threatened species found in few pockets of eastern India, including **Odisha's Bhitarkanika and West Bengal's Sundarbans.** The first census of mangrove pitta (Pitta megharencha) birds **was mainly focused on the mangrove patches all along the coasts** of Kendrapara and Jagatsingpur districts. The birds were counted by direct sighting and from their chirping.

Mangrove Pitta Birds

- Mangrove Pitta is a species of bird that is **endemic to the mangrove forests** of South and Southeast Asia.

Scientific name: Pitta Megarhyncha

- The Mangrove Pitta inhabits mangrove forests **along the coast and in the deltas of Southeast Asia**. It is found in countries such as India, Bangladesh, Myanmar, Thailand, Malaysia, Indonesia, and the Philippines.
- The Mangrove Pitta has a **bright blue head and neck**, with a **black mask that extends from the eyes to the nape**. Its upperparts are green, while its underparts are yellow. It has a long and strong bill that is used to dig for insects in the mud.
- The Mangrove Pitta is a **shy and elusive bird** that is often heard before it is seen. It **feeds on insects, crustaceans, and molluses**, which it finds by probing the mud with its bill. It is a **solitary bird** that is often found in pairs during the breeding season. Mangrove Pitta is an important **indicator species** of the health and biodiversity of mangrove ecosystem.
- Threats: Mangrove pittas are threatened by **habitat loss due** to deforestation, **conversion of mangroves to aquaculture ponds**, and urbanization. They are also **hunted for food and trapped for the pet trade. Conservation status**: The Mangrove Pitta is listed as **Near Threatened** on the IUCN Red List.

Topic 5. GREAT PACIFIC GARBAGE PATCH

Important for the subject: Environment

In the Great Pacific Garbage Patch, coastal life piggybacks on plastic trash.

What is the Great Pacific Garbage Patch?

- There are some **water currents in the oceans that, driven by winds and the Coriolis force,** form loops. These are **called gyres.**

- The North Pacific Subtropical Gyre (NPSG) is one such, **located just north of the equator in the Pacific Ocean.** It consists of the Kuroshio, North Pacific, California, and North Equatorial currents and moves in a clockwise direction. These currents flow adjacent to 51 Pacific Rim countries. Any trash that enters one of these currents, from any of these countries, could become part of the gyre.

- Inside this gyre, just north of Hawaii, lies a **long east-west strip where some of the debris in these currents has collected over the years**. The eastern part of this is the Great Pacific Garbage Patch. It is, per one estimate, **6 million sq. km big** and more than **50 years old.**

- The patch contains an **estimated 45,000-1,29,000 metric tones of plastic**, predominantly in the form of microplastics. The **numerical density of plastics here is around 4 particles per cubic meter**. Mass-wise, however, heavier, more visible objects that haven't yet broken down into smaller particles accounted for 92% in 2018.

What did the new study find?

- The **tsunami off the Japanese coast in 2011 contributed to the debris** in this garbage patch. Until at least 2017, researchers had found debris washing ashore on the West coast of North America containing live life forms originally found in Japan.

- From November 2018 to January 2019, researchers collected 105 pieces of plastic debris from the eastern part of the NPSG, "the most heavily plastic-polluted ocean gyre on the globe"

- Based on studying them, they reported that **98% of the debris items had invertebrate organisms**. They also found that **pelagic species** (i.e. of the open ocean) **were present on 94.3% of them** and **coastal species, on 70.5%.** That is, organisms found on coasts were getting by on small floating islands of garbage (to humans) out in the Pacific Ocean.

- The number of coastal species such as a**rthropods and molluses identified rafting on plastic** was over three-times greater than that of pelagic species that normally live in the open ocean

- In all, they found organisms belonging to 46 taxa, and 37 of them were coastal; the rest were pelagic. **Among both coastal and pelagic organisms, crustaceans were the most common**. The coastal species were most commonly found on fishing nets whereas the pelagic species, on crates.

What do the findings mean?

- The researchers have written in their paper that "the **introduction of a vast sea of relatively permanent anthropogenic** rafts since the 1950s" has **given rise to a new kind of "standing coastal community** in the open ocean". They've named it the **neo-pelagic community**.

- They write in their paper that while **coastal species have been found on humanmade objects in the open ocean before, they were always considered to have been "misplaced" from their intended habitats**. The **neo-pelagic community**, on the other hand, is not misplaced **but lives on plastic items in the garbage patch, including reproducing there.**

- The finding recalls a study published on April 3, in which researchers reported that **polyethylene films had chemically bonded with rocks in China** – which is reminiscent, in turn, of the "**anthropoquinas**" of Brazil (**sedimentary rocks embedded with plastic**

earrings) and the "**plastiglomerates**" of Hawai'i (**beach sediment + organic debris + basaltic lava + melted plastic**).

Aquatic Zones

- The **littoral zone** is the **shallow water near the shore**. In the ocean, the littoral zone is also called the intertidal zone.
- The **pelagic zone** is the **main body of open water farther out from shore**. It is divided into additional zones based on water depth.
- In the ocean, the part of the pelagic zone over the continental shelf is called the **neritic zone,** and the rest of the pelagic zone is called the **oceanic zone.**
- The **benthic zone** is the **bottom surface of a body of water**. In the ocean, the benthic zone is divided into additional zones based on depth below sea level.

Topic 6. CAN WE DEMOCRATIZE TIGER CONSERVATION IN INDIA

Important for the subject: Environment
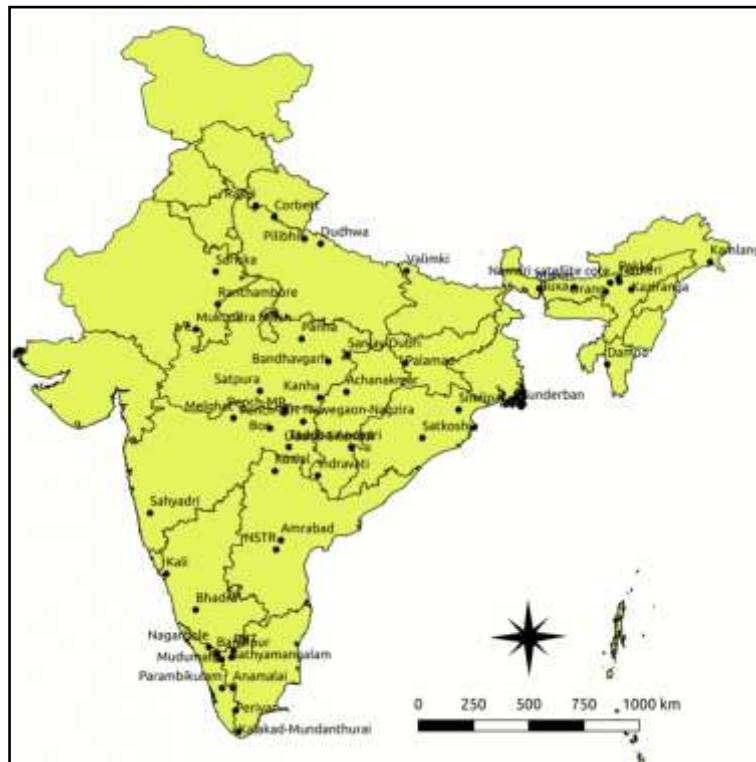
Scientists were happy Project Tiger was able to hold on to tiger populations. The 2023 preliminary report finds that this hold is slipping. The tiger number released and the minimum estimate based on the tigers photographed during the survey. The final estimates

will come in the next few months; authorities have **indicated a 6% annual growth rate**, so the expected number would be approximately 25-30% above the previous 2018-2019 estimate of 2,967 tigers.

Many scientists, while not impressed by the figures, were happy that **Project Tiger was able to hold on to tiger populations in most of the geographical regions where they existed** at its inception. However, in the 2023 preliminary report, for the first time, finds that this hold is slipping away. N**ow losing tigers from Jharkhand, Chhattisgarh, and the Eastern Ghats** and **from the Northeastern forests**. With it, **lose genetic diversity unique** to these geographical regions, dashing hopes of **maintaining long-term population viability and natural recovery.**

Challenges in Tiger Conservation Approach:

- **Reintroduction of Tigers:** A tool that is increasingly being used is to reintroduce tigers from central Indian forests, where the populations are thriving, as was done for the Panna and the **Sariska Tiger Reserves**. However, **if this is done too often, re-introduction will homogenise tiger genetic structure** across the country.
- **Absence of proper scientific oversight:** therefore, focus stayed on boosting tiger numbers rather than their habitat and concomitant species.
- **Manipulating ecosystems**: the most common interventions were to manipulate ecosystems so that they could **support high densities of the tiger's principal prey species**. In most cases, this **involved improving habitat for cheetal**, a mixed feeder that thrives in the "ecotone" between forests and grasslands.
- For example, in the **Kanha Tiger Reserve,** the **explosion in the cheetal population resulted in the habitat becoming unsuitable** for the endangered hard ground **barasingha**, which depends on tall grass. Managers then **had to create exclosures free of cheetal** so that the **barasingha** could reproduce, and their numbers recover.
- **Excessive provisioning of water**: during the dry season tends to **reduce natural, climate driven variations** in populations of wildlife. This is likely to have **unknown and unintended consequences** for these habitats in the long-term.

Policy issues:

- Conservation in India **depends entirely on a network of Protected Areas** (PAs). This is

an exclusive conservation model and suffers from a "sarkaar" complex.

WLPA is a restrictive law. It describes in **great detail what you can't do**.

- However, the law and associated policies have done very little to enable conservation. There is **no policy framework and incentive for ordinary citizens** to aid in **conservation** – be it for tigers or for any other species. As a result, conservation has not reached beyond these PAs.

Suggestions:

- Have **frameworks that allow local communities, citizens, scientists, nongovernmental organizations, and businesses to participate** meaningfully in conservation.
- For example, large tracts of forest land are "Reserved Forests" under the jurisdiction of the "territorial" wing of State Forest Departments. Such areas can be co-managed with an approach that is inclusive and provides economic benefits for local communities.
- **Vision document that examines** these figures critically and provides a way forward for the next 20 years. In many landscapes**, degraded agricultural lands adjoining these forest areas can be restored to enhance connectivity** between Protected Areas.

Topic 7. CLIMATE CHANGE AND COASTAL EROSION

Important for the subject: Environment

What features does coastal erosion cause?
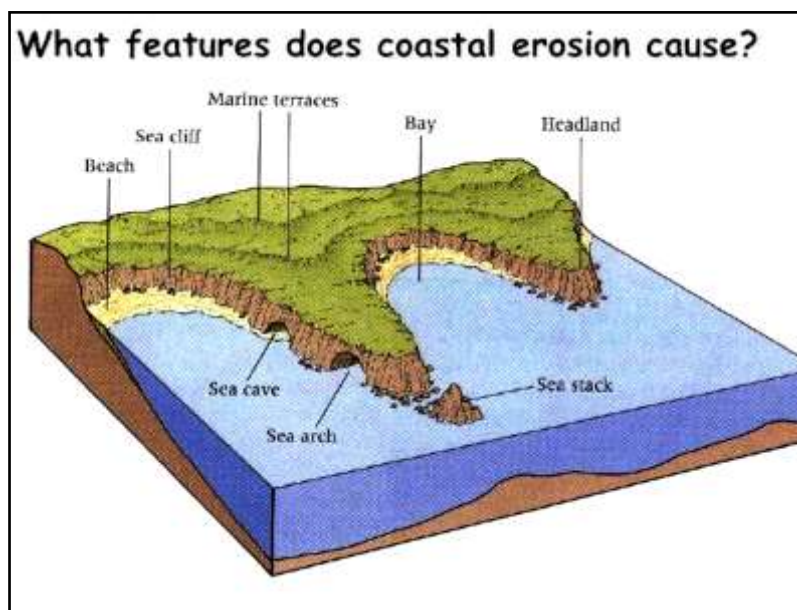
Left with just 11 inhabitants, a village caught between climate change and sea. Since 2007, when the marauding sea started making swift advances to reclaim land. Over 500 families deserted the Podampeta village, condemning the oncethriving hamlet to a deserted shadow of its former self. Once home to over 1,500 fisherfolk, it is currently **inhabited by just 11 persons belonging to the two remaining families**, one of them Paindi's.

- Podampeta **lies quiescent on the shores of the Bay of Bengal**, near the mouth of Rushikulyariver.

- According to **Odisha's climate change action plan**, made by its Forest and Environment Department, of the coast length of 480 km, nearly 187 km is exposed to erosion and considered stable; 39.3 km falls in the high-erosion zone; while 51.96 km has been designated as falling in the medium-erosion zone.

- The **action plan emphasized Odisha's particular vulnerability to the impact of climate change in the form of rise in sea levels** and increased intensity of storms. Loss of land to sea has become a more recurrent and frequent phenomenon.

- According to a study on 'Shoreline Change along Odisha Coast', published in the Journal of Earth System Science in 2021, **coastal structures such as sea walls, breakwaters and jetties result in modification of the shoreline and beach morphology**.

- Construction of hard structures along the coast, either for development of ports and harbors significantly modifies the shoreline. Besides, natural hazards such as tsunami and cyclone storms along the Indian coast have resulted in significant changes in the shoreline. It said that along the east coast of India, Odisha is most prone to cyclones. Cyclones along the Odisha coast **cause severe damage to coastal life and coastal structures.**

Topic 8. FINDING GONDRA AMID THE FLOODS

Important for the subject: Environment

Sahariya Adivasis **gather and treat a river sedge called 'gondra'**, the roots of which are used in manufacturing perfume. The Sahariyas rely on gondra for subsistence. Sahariyas living in Madhya Pradesh on the banks of Sindh River were impacted by a flash flood in August 2021 and other subsequent weather events. Changes in the river's ecology and climate impact the accessibility of gondra, and consequently the livelihoods of one of the most vulnerable communities in India.

River Sedge (Gondra)

- River sedge, locally called 'gondra', is **a grass-like plant species** that grows in the **riverine plains of the Himalayan region**. It belongs to the Cyperaceae family and is **found in the foothills of the Himalayas**, in states like Uttarakhand, Uttar Pradesh, Bihar, and West Bengal.

- It is used by **local communities for weaving traditional baskets**, mats, and other handicrafts, and is an **important source of livelihood for them**. The sedge is also **used for making ropes, for thatching roofs**, and as a **biofencing material**.

- The **plant is drought-resistant** and can grow on sandy and moist river banks. Gondra is a **medicinal plant** that is **used in Ayurvedic cures** in dry or powdered form. The **essential oil (0.5-0.9%) from the tuber** is used in perfumery, soap making and in insect repellents. The r**aw material that remains after extracting the oil is used for making the body of incense sticks.**

- Additionally, some species of gondra are **used for soil stabilization and phytoremediation of contaminated sites.**

Sahariya Tribe

- Sahariyas are a **tribe living in the border regions** of Rajasthan and Madhya Pradesh in India. They are classified as **particularly vulnerable tribal groups**. The Sahariya community **considers every adult member part of a governing council** which is headed by a patel.

- The Sahariyas are **expert woodsmen and forest product gatherers**. They are **particularly skilled in making catechu** from Khair trees.

Topic 9. INDIA UNDERESTIMATING HEATWAVE IMPACT

Important for the subject: Environment

Climate experts and policymakers should re-evaluate the metrics for assessing the country's climate vulnerability as heat waves in India and the Indian subcontinent become recurrent and long-lasting.

- India has been underestimating the impact of heatwaves on its development. More than **90 per cent of the country is at risk of suffering losses** in livelihood capacity, food

grains yields, vector-borne disease spread and urban sustainability. The **government's estimate is from the National Climate Vulnerability Index** (CVI), developed by the Department of Science and Technology.

- CVI is a composite index that **uses various indicators to evaluate climate impact** on India's socio-economic features and livelihood, biophysical, institutional and infrastructural characteristics. CVI is a robust metric. But it **underestimates the vulnerability from heat waves** as it does **not include any physical risk factors from extreme heat**, according to a new study by the University of Cambridge. Climate experts **and policymakers should re-evaluate the metrics for assessing the country's climate vulnerability** as heat waves in India and the Indian subcontinent become recurrent and long-lasting, they added.

Heat Waves:

- A heat wave is a **period of abnormally high temperatures**, more than the normal maximum temperature that occurs during the summer season in the North-Western and South Central parts of India. It is a condition of air temperature which **becomes fatal to the human body** when exposed.
- The IMD declares a heatwave when the **maximum temperature crosses a certain threshold — 40°C in the plains, 37°C along the coast, and 30°C in hilly regions**. Alternatively, a heat wave is declared **if the maximum temperature rises by between 5°C and 6.4°C above normal**.
- A **severe heatwave** is declared when the **maximum temperature rises more than 6.4°C above normal.** A third condition for a heatwave arises when an area records a **maximum temperature of more than 45°C and up to 47°C on any given day**.

Topic 10. KFRI ON A CLEAR-THE-AIR CAMPAIGN FOR BATS

Important for the subject: Environment

The institute is on a mission to dispel myths associated with bats and create awareness of their diversity, ecosystem functions, threats faced by the flying mammals.

- Bats have been cloaked in superstition since ancient times. Their nocturnal nature and spooky appearance place them in horror stories.
- KFRI Director launched a social media campaign 'Bat for Bats' at the institute recently as

part of International Bat Appreciation Day. KFRI plans to conduct awareness programmes about bats in schools, colleges, and for the public KFRI, says the public is largely unaware of the economic and environmental benefits that bats provide to humans.

- At least eight bats in Odisha's Jajpur district **died as a heatwave swept across the state**, compelling forest officials to **spray water to maintain temperatures** and hydrate the remaining bats to help them survive.

- Scientists and experts fear that the **increase in temperatures and frequency of heat waves due to climate change** may result in a **mass population collapse**. A large number of bats dying from heatwaves may also **lead to ecological imbalances and increased spread of zoonotic diseases.**

Bats:

- Bats are the **only mammals capable of sustained flight**. They belong to the order **Chiroptera**, which means "hand-wing" in Greek.

- There are over 1,400 species of bats, comprising around **20% of all mammal species**. Bats are found worldwide, **except in the polar regionsand some isolated islands**.

Ecological Significance:

- **Seed dispersal**– The diet of fruit-eating bats consists largely of flowers and fruits such as mangoes, bananas, guavas, custard apples, figs, tamarind and many species of forest trees.

- **Pollination**– Studies have found that bats play a vital role in pollination, mainly of large-flowered plants, and in crop protection.

- **Production boost**– Some large insectivorous bats are also reported to feed on small rodents.

- **Soil fertility**– Bat droppings provide organic input to soil and facilitate nutrient transfer, contributing to soil fertility and agricultural productivity.

- **Health benefits**– contribute to human health by reducing populations of mosquitoes and other insect vectors that spread malaria, dengue, chikungunya and other diseases.

Threats

- Anthropogenic factors such as **habitat loss, poaching, environmental pollution**, Climate change, and **biological invasions** have caused the decline of bat population worldwide.

- Due to their **low reproductive rate, gregarious lifestyle**, and high metabolic rate, most bat species cannot withstand anthropogenic pressures.

Topic 11. CARBON OFFSET

Important for the subject: Environment
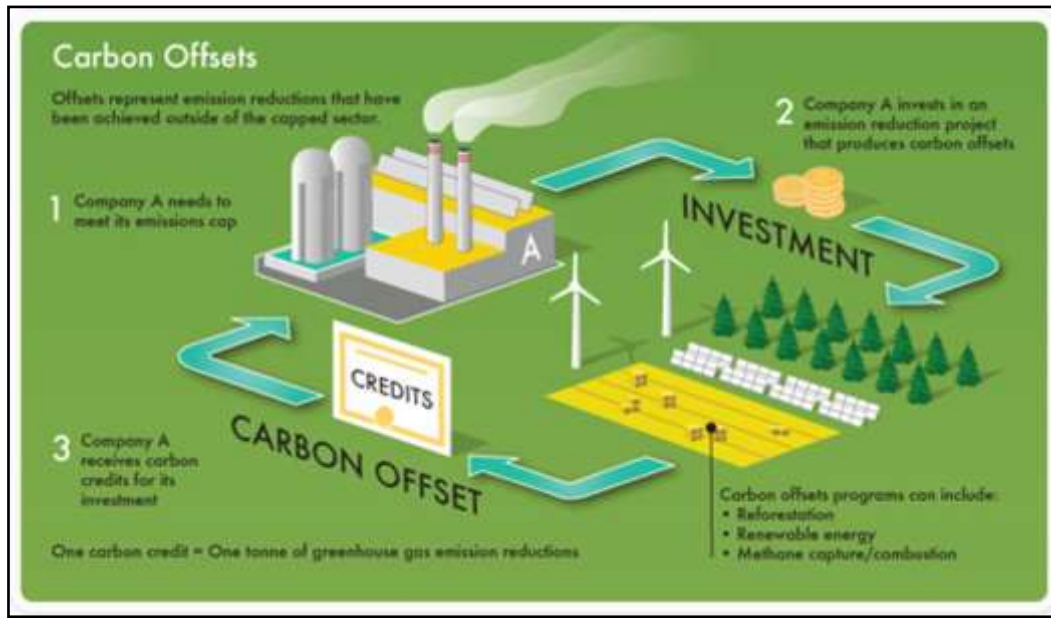
Off sets have come under fire as a way for companies to compensate for carbon emissions through eco projects elsewhere.

How does offsetting work?

- Buying offsets is a **way to "compensate" for environmental damage**. Companies make a **financial contribution to projects that reduce the amount of carbon dioxide** in the atmosphere, and in exchange can keep polluting themselves.

- Examples of projects include planting trees and rewetting peatlands — which store huge amounts of carbon in their soil. In recent years, the carbon offset industry has boomed. It is **worth $2 billion** (€1.87 billion) annually and is expected to grow five times that size by the end of the decade.

- After the concept's invention in 1987, some international treaties such as the **Kyoto protocol have let industrialized countries use carbon credits**, each of which is worth one ton of carbon, to keep within emissions limits. That market —— where carbon credits are traded to meet government regulations — is much bigger, about $261 billion a year.

Offsetting in practice

- Offset projects can be broadly split into two categories: **removals and avoidances**.
- Removal describes actions which **actively take carbon out of the air and store it permanently**, such as **by planting trees or direct air capture** — which is not a technology available at scale. Currently **carbon dioxide removal** represents just a small percentage of the carbon credits in circulation.
- **Avoidance offsets** are from projects that **stop the release of greenhouse gases**, such as protecting trees from being logged.

Problems with Carbon offsetting:

- **Additionality:** Additionality refers to the idea that carbon offset projects **should only be considered legitimate if they result in reductions in greenhouse gas emissions** that would not have occurred in the absence of the project. However, it is **difficult to determine whether a project is truly additional** and **whether the emissions reductions would have occurre**d anyway without the offset project.
- **Permanence:** Carbon offsetting projects such as **reforestation, afforestation, or carbon sequestration can be reversed if the trees are cut down, wildfires occur**, or soil carbon is released. This means that carbon offsetting is not a permanent solution and cannot guarantee long-term emissions reductions.
- **Leakage:** Leakage refers to the situation where **emissions are shifted from one location to another as a result of a carbon offsetting project**. For example, a forestry project may lead to deforestation in another area, or a renewable energy project may lead to higher emissions from other energy sources due to increased demand.
- **Verification**: There is a **lack of standardized and transparent verification mechanisms** for carbon offsetting projects. It is difficult to ensure that the projects are genuinely reducing emissions and that the credits generated are not being double-counted or sold more than once.
- **Ethical concerns:** There are concerns about the ethics of carbon offsetting, particularly when it **comes to projects that involve land acquisition** or that may have **negative impacts on local communities or biodiversity.**

Topic 12. WHITE TIGER

Important for the subject: Environment

White tiger cubs Avani & Vyom released for public viewing at Delhi Zoo.

White Tiger:

- The white tiger or bleached tiger is a **leucistic pigmentation variant** of the Bengal tigers, Siberian Tiger and man-made hybrids between the two. They are **reported in the wild** from time to time in the Indian states of **Madhya Pradesh, Assam, West Bengal, Bihar and Odisha** in the Sundarbans region and especially in the former State of Rewa.
- Such **a tiger has the black stripes typical of the Bengal tiger**, but carries a white or near-white coat. The **first white tiger was spotted in Madhya Pradesh's** Vindhya region, in which the Satna district falls, in 1915. The rare breed of the big cat, which was caught for the first time, died in 1920.

Topic 13. WIND, SOLAR CLEANER FOR ENERGY TRANSITIONS THAN OTHER RENEWABLES

Important for the subject: Environment

Clean energy coalition of WWF, IRENA says shift to renewable energy must protect nature; all forms of renewable power are better than fossil fuels.

Findings:

- A **transition to Net Zero** by **scaling up wind and solar energy** projects would be **significantly less damaging** than other renewable pathways, stated a new report by non-profit World Wide Fund for Nature (WWF) and intergovernmental organisation International Renewable Energy Agency (IRENA).
- **Adopting the right mix of low-carbon technologies** to meet energy demand can help **stabilise global temperatures and protect ecosystems**, noted the document by Coalition Linking Energy and Nature for action (CLEANaction).
- Construction of other renewable energy projects, such as **hydropower dams and associated reservoirs, often leads to the inundation of vast swathes** of natural habitat and alters natural flow regimes and downstream habitats, the document added.

- Bioenergy, for instance, in all its forms, including **biomass, biofuel and biogas**, has a **larger biodiversity impact per unit of energy** than that of wind and solar.

Coalition Linking Energy And Nature for action:

- Coalition Linking Energy and Nature for action (CLEAN) is a global initiative that aims to **accelerate the transition to a low-carbon economy** by promoting the sustainable production and use of bioenergy.
- It was launched in 2019 by the **International Renewable Energy Agency** (IRENA) in partnership with the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP), the United Nations Industrial Development Organization (UNIDO), the Global Environment Facility (GEF), and other international organizations.
- CLEAN action aims to **highlight the need for new renewable energy generation projects to be carefully assessed for their impacts on biodiversity**, allowing the options that are the least damaging to nature to be prioritised.
- Today, many renewable energy developers have little awareness or consideration for the impact on nature, be it on land, the ocean, or freshwater ecosystems. CLEAN action hopes to change this, so that the **effect on biodiversity is a required element of any new proposed energy initiative.**

Topic 14. WMO

Important for the subject: Environment

Around 15,000 deaths caused in Europe in 2022 due to heat: What the new World Meteorological Organisation report says 2022 Heatwaves in Europe The United Kingdom experienced 40-plus degree Celsius heat for the first time ever. **Ireland** had its highest temperature since 1887. **Hamburg, in Germany**, became the most northern part of the country to ever **record 40 degree Celsius temperature.** Even **Sweden**, one of the coldest countries, recorded temperatures **in excess of 37 degree** Celsius last year.

During the summer, around 4,600 deaths in Spain, 4,500 in Germany, 2,800 in the United Kingdom (among those aged 65 and older), 2,800 in France and 1,000 in Portugal were associated with the unusual heat.

Heatwave:

- A **heatwave** is a **period of abnormally high temperatures**, a common phenomenon in India during the months of **May-June** and in some rare cases even extends till July.
- **India Meteorological Department (IMD)** classifies heat waves according to regions and their temperature ranges. As per IMD, the number of heatwave days in India has increased from 413 over 1981-1990 to 600 over 2011-2020.

Criteria for declaring the heat wave:

- The **Heatwave** is considered when the **maximum temperature of a station reaches at least 40°C for Plains** and **at least 30°C for Hilly regions.** If the **normal maximum temperature of a station** is less than or equal to **40°C**, then an increase of **5°C** to **6°C** from the normal temperature is considered to be heat wave condition.
- Further, an **increase of 7°C or more** from the normal temperature is considered a **severe heat wave condition.**
- If the **normal maximum temperature of a station** is more than **40°C**, then an **increase of 4°C to 5°C** from the normal temperature is considered to be heat wave condition. Further, an increase of **6°C** or more is considered a **severe heat wave condition.**
- Additionally, if the **actual maximum temperature remains 45°C** or more irrespective of normal maximum temperature, a heat wave is declared.

WMO observations:

- On average, **global temperature in 2022 was 1.15 degree Celsius higher than pre-industrial times,** which is the average of the 1850-1900 period. This happened despite the **prevalence of a strong La Nina event** which is known to have an **overall cooling impact on the planet.**

Rise in GHG emissions and concentrations:

- The three main greenhouse gases – **carbon dioxide, methane and nitrous oxide** – responsible for global warming, were all at record high in 2021. **Carbon dioxide** concentrations in atmosphere now exceed 415 parts per million.
- The **concentrations of methane,** less prevalent but more damaging than carbon dioxide, **increased to 1908 parts per billion in 2021.** The increase of **18 ppb** between **2020 and**

2021 was the highest annual rise ever.

Displacement due to climate change:

- About **95 million people** across the world had already suffered **displacement because of climate change reasons.** Most people displaced in **climate- or weather-related events remained within the territories where they resided,** while in some situations people were forced to flee across international borders in search of safety and assistance.

Status of heatwaves in previous years:

- The **warmest year on record so far has been 2016** when average global temperatures were measured to be **1.28 degree Celsius higher than preindustrial times**, not very far away from the 1.5 degree Celsius milestone, which is the world is aiming to avoid.
- The years **2015 to 2022** have been the **eight warmest years** in the **173 years of direct record keeping**. The year **2022** would be **fifth or sixth** on that list of warmest years.

Topic 15. UN REPORTS 'OFF THE CHARTS' MELTING OF GLACIERS

Important for the subject: Environment

The last eight years have been the warmest ever recorded, while concentrations of greenhouse gases such as carbon dioxide hit new peaks, the **UN's World Meteorological Organization.**

Findings of the report:

- The world's glaciers melted at **dramatic speed last year** and saving them is effectively a lost cause, the United Nations reported, as climate change indicators once again hit record highs.
- The last eight years have been the warmest ever recorded, while **concentrations of greenhouse gases such as carbon dioxide hit new peaks**, the UN's World Meteorological Organization.
- **Antarctic sea ice fell to its lowest extent** on record and the melting of some European glaciers was, literally, off the charts **Sea levels** are also at a **record high**, having **risen** by an average of 4.62 millimetres per year between 2013 and 2022 — **double the rate it was between 1993 and 2002**.
- Record high temperatures were recorded in the oceans — where around **90% of the heat**

trapped on Earth by greenhouse gases ends up. The **global mean temperature in 2022 was 1.15 C above** the 1850-1900 average, the WMO report said **greenhouse gas concentrations reached new global highs** in 2021.

- The **concentration of carbon dioxide (CO2) reached 415.7 parts per million globally**, or 149% of the pre-industrial (1750) level, while methane reached 262% and nitrous oxide hit 124%.

- The world's reference glaciers — those for which long-term observations exist — saw an **average thickness loss of more than 1.3 metres between October 2021 and October 2022** — a loss much larger than the average over the last decade.The**cumulative thickness loss since 1970 amounts to almost 30 metres.**

UNESCO finds that some iconic World Heritage glaciers will disappear by 2050 Africa:

- According to available data, glaciers in all World Heritage sites in Africa will very likely be gone by 2050, incl. Kilimanjaro National Park and Mount Kenya

Asia:

- Glaciers in **Three Parallel Rivers of Yunnan Protected Areas** (China) – #1 highest mass loss relative to 2000 (57.2%) and also the **fastest melting glacier on the List**

- **Glaciers in Western Tien-Shan** (Kazakhstan, Kyrgyzstan, Uzbekistan) have shrunk by 27% since 2000

Europe:

- **Glaciers in Pyrenees Mont Perdu** (France, Spain) – very likely to disappear by 2050
- **Glaciers in The Dolomites** (Italy) – very likely to disappear by 2050

Latin America:

- **Glaciers in Los Alerces National Park** (Argentina) – #2 highest mass loss relative to 2000 (45.6%)

- **Glaciers in Huascaran National Park** (Peru) have shrunk by 15% since 2000

North America:

- **Glacierized patches in Yellowstone National Park** (United States of America) – very likely to disappear by 2050

- **Glaciers in Yosemite National Park** (United States of America) – very likely to disappear by 2050

- **Glaciers in Waterton Glacier International Peace Park** (Canada, United States of America) have lost 26.5% of their volume in 20 years

Oceania:

- **Glaciers in TeWahipounamu** – South West New Zealand (New Zealand) have lost almost 20% of their volume since 2000

Topic 16. ANDHRA MINING AGENCY TOLD TO 'GO BACK' BY NIMMALAPADU TRIBALS AT PUBLIC HEARING

Important for the subject: Environment

First hearing since 1997 Supreme Court judgment, Kept out of mining lease decisions at least five times despite legal win, say villagers.

- A public hearing for granting mining licences in a Fifth Schedule village in Andhra Pradesh was met with slogans to "go back" by tribal community members.

- Nimmalapadu had **won a legal battle in 1997 against the state government and a private company** to **save their village from mining** and has staved off several attempts to violate the ruling since then.

- This public hearing was the first one in 31 years and came two months **after Andhra Pradesh Mineral Development Corporation (APMDC) prepared an Environment Impact Assessment (EIA) report** for obtaining environmental clearances. This is a fresh attempt by APMDC to grant mining licenses in the region.

- The residents alleged the APMDC issued licences five times since 1997 to cooperatives or individuals from the state belonging to the Konda Dora community who did not belong to these villages. The state agency found new ways to keep the people out of the process and no hearings were conducted for granting these licences.

SC Direction:

- The 1997 judgement was popularly called the **Samatajudgement** after the name of the non-profit that helped the people fight the case.

- In the landmark ruling, the Supreme Court had **declared that only people belonging to**

the **Konda Dora tribe and their cooperatives could exploit minerals in Fifth Schedule** areas and **that private mining, even with government backing**, is Supreme Court **reiterated the Constitution's Fifth Schedule that land and resources in these areas should belong to the Scheduled Tribes**. The state government should be responsible for encouraging tribal people to come forward by providing the necessary support.

Konda Dora tribe

- Konda Dora is **a tribal community** living in the **hilly regions of the Eastern Ghats in Andhra Pradesh and Odisha**. They are also known as Kondadora or Kondh, and speak the Kui language.
- The Konda Dora tribe is known for their unique cultural practices, including the **worship of the earth goddess, DharaniPenu.** They also have a rich tradition of oral literature, which includes folk songs, myths, and legends.
- The Konda Dora community **is primarily involved in agriculture and forestbased livelihood activities** such as hunting, fishing, and gathering of forest products. They **practice shifting cultivation** and grow crops such as paddy, millets, and vegetables. The tribe also has traditional knowledge about herbal medicines, which they use to treat various ailments.
- The Konda Dora community has faced several challenges, including **displacement from their ancestral lands due to mining** and other development activities. They have also struggled with **poverty, lack of access to basic amenities, and discrimination**.

Topic 17. UN REPORTS 'OFF THE CHARTS' MELTING OF GLACIERS

Important for the subject: Environment

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Findings of the report:

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- The last eight years have been the warmest ever recorded, while **concentrations of greenhouse gases such as carbon dioxide hit new peaks**, the UN's World Meteorological Organization.

- **Antarctic sea ice fell to its lowest extent** on record and the melting of some European glaciers was, literally, off the charts **Sea levels** are also at a **record high**, having **risen** by an average of 4.62 millimetres per year between 2013 and 2022 — **double the rate it was between 1993 and 2002**.

- Record high temperatures were recorded in the oceans — where around **90% of the heat trapped on Earth by greenhouse gases ends up.**

- The **global mean temperature in 2022 was 1.15 C above** the 1850-1900 average, the WMO report. The report said **greenhouse gas concentrations reached new global highs** in 2021.

- The **concentration of carbon dioxide (CO_2) reached 415.7 parts per million globally**, or 149% of the pre-industrial (1750) level, while methane reached 262% and nitrous oxide hit 124%.

- The world's reference glaciers — those for which long-term observations exist — saw an **average thickness loss of more than 1.3 metres between October 2021 and October 2022** — a loss much larger than the average over the last decade.The**cumulative thickness loss since 1970 amounts to almost 30 metres.**

UNESCO finds that some iconic World Heritage glaciers will disappear by 2050 Africa:

- According to available data, glaciers in all World Heritage sites in Africa will very likely be gone by 2050, incl. Kilimanjaro National Park and Mount Kenya

Asia:

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Europe:

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- **Glaciers in Waterton Glacier International Peace Park** (Canada, United States of America) have lost 26.5% of their volume in 20 years

Oceania:

- **Glaciers in TeWahipounamu** – South West New Zealand (New Zealand) have lost almost 20% of their volume since 2000

Topic 18. SUPERCRITICAL CARBON DIOXIDE

Important for the subject: Environment

A new research by IIT Madras has suggested the use of Supercritical carbon dioxide to flush out oil from depleting oil and gas reservoirs.

About Supercritical carbon dioxide:-

- Supercritical carbon dioxide (CO_2) is a **fluid state of CO2 where it is heated and held at or above its critical temperature ($31 \circ C$) and pressure(73 atm).**
- In this supercritical phase, **CO2 exhibits properties and behaviours between that of a liquid and a gas.**
- Supercritical CO2 possesses liquid-like densities with gas-like diffusivity, surface tension and viscosity.

'**Surfactant-Alternating gas (SAG) injection' approach:**

- In this process, **carbon dioxide gas is injected into the reservoir, where it becomes supercritical**, **followed by injection of water or surfactant solution**.

Use of Supercritical Carbon Dioxide (CO2):-

- It is used in the oil and gas industry for gas injections during enhanced oil recovery (EOR) techniques.
- When supercritical CO2 reacts with water, carbonic acid (H2CO3) is formed. Carbonic acid lowers the pH in the reserve and creates an environment that is corrosive to metal equipment.

Topic 19. DALAI LAMA

Important for the subject: International Relations

About:

Dalai Lama is a **title given** by the Tibetan people for the **foremost spiritual leader** of the **Gelug or "Yellow Hat"** school of Tibetan Buddhism, the newest of the classical schools of Tibetan Buddhism. The **14th** and current Dalai Lama is **Tenzin Gyatso.**

- He was **born on 6 July 1935**, to a **farming family**, in a small hamlet located in T**aktser, Amdo, northeastern Tibet.** At the **age of two**, the child, then named **LhamoDhondup**, was recognized as the reincarnation of the previous **13th Dalai Lama, ThubtenGyatso.**
- The Dalai Lamas are believed to be **manifestations of Avalokiteshvara or Chenrezig**, the **Bodhisattva of Compassion** and the **patron saint of Tibet**. Bodhisattvas are realized beings inspired by a wish to **attain Buddhahood** for the benefit **of all sentient beings,** who have vowed to be **reborn in the world** to help humanity.
- In his Holiness the **Dalai Lama 1989 he was awarded the Nobel Peace Prize** for his non-violent struggle for the liberation of Tibet.

Following the **Buddhist belief** in the **principle of reincarnation**, the current Dalai Lama is believed by Buddhists to be **able to choose the body** into which he is **reincarnated**.

- That person, when found, will then become the next Dalai Lama. According to Buddhist scholars it is the **responsibility of the High Lamas of the Gelugpa tradition and the**

Tibetan government to seek out and find the next Dalai Lama following the death of the incumbent. If **more than one candidate is identified, the true successor is found by officials and monks drawing lots in a public ceremony**.

- Once identified, the s**uccessful candidate and his family are taken to Lhasa** (or Dharamsala) where the **child studies the Buddhist** scriptures in order to prepare for spiritual leadership. This process can take several years: it **took four years to find the 14th (current) Dalai Lama.**

- The search is g**enerally limited to Tibet, although the current Dalai Lama has said that there is a chance that he will not be reborn**, and that if he is, it will not be in a country under Chinese rule.

Leadership Responsibility:

- In **1950**, after **China's invasion of Tibet,** His Holiness was called upon to **assume full political power.**

- In **1954**, he went to **Beijing** and met with **Mao Zedong and other Chinese leaders,** including **Deng Xiaoping and Chou Enlai.**

- Finally, in **1959,** following the brutal suppression of the **Tibetan national** uprising in **Lhasa by Chinese troops,** His Holiness was **forced to escape into exile**. Since then he has been **living in Dharamsala**, northern India.

Claim of suzerainty:

- Communist China had always held a **claim of suzerainty over Tibet**, which included the **assertion that Tibet** had become a **"protectorate" of Manchu Ruled China** in the late 17th century.

Topic 20. CHINESE DUAL-USE FACILITIES IN MYANMAR AND SRI LANKA

Important for the subject: International Relations
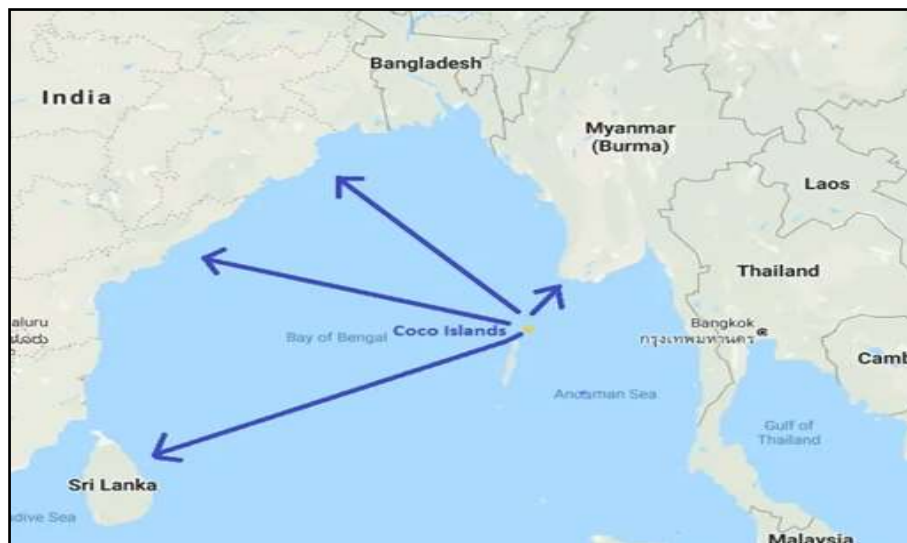
China's investment in dual-use facilities in Myanmar and Sri Lanka has raised concerns and created unease among its neighbours about China's growing influence in the region and the potential security implications of these projects.

Myanmar is building a **military installation on Coco Islands a**nd there is a proposal for the **establishment of a remote satellite receiving ground station in Sri Lan**ka, **both with the assistance of China.** This has prompted apprehension in India about potential surveillance throughout the area.

- These projects are **seen as part of China's Belt and Road Initiative**, which aims to build infrastructure across Asia and beyond to enhance China's economic and strategic interests.
- One of the most **controversial projects is the Kyaukpyu deep-sea port in Rakhine state**, which is strategically located near the Bay of Bengal and the Indian Ocean.
- Many have raised concerns about the project's potential military uses and the fact that it could give China a strategic foothold in the region.
- Recent satellite images show the **construction of a military facility on Coco Islands, located very close to the Andaman and Nicobar island chain.**
- The island is being connected to the southern landmass using a new bridge that is 175 m in length and approximately 8 m wide.

- China has also proposed setting up a remote satellite receiving ground station system in Sri Lanka in collaboration.
- **Satellite tracking facilities are inherently dual use in nature**, and the Chinese civil space program is known to work closely with the Chinese military.

Coco Islands

- Coco Islands are a small group of Islands located In the North-Eastern part of Bay of Bengal. It Is Situated 30 Miles North to the Andaman and Nicobar Islands Group Of India, to 250 Km South of the Burmese Mainland and 1255 Km South-East of Kolkata. North of this Island Group lies Preparis Island also belong to Myanmar, and to the South lies the land for Island belonging to India.
- Coco Island Group consists of four islands on the Great Coco Reef and another Rai Coco Island on the Little Coco Reef. Coco Channel separates India's Andman Islands and Coco Islands of Myanmar.

Topic 21. SUDAN CRISIS

Important for the subject: International Relations

Fighting broke out between the **Sudanese army and the country's main paramilitary group on April 15, 2023.**

- **Paramilitary forces** claim to have taken control of the **international airport in Khartoum** as well as a second airport in Meroe.

- The paramilitary Rapid Support Forces also claimed to have taken over the **Presidential Palace and Army Chief General Burhan's residence.**

- Many videos appeared on social media showing armed fighters driving across the runway of the city's international airport, conducting checkpoints at crucial traffic intersections, and moving through residential areas.

Note: The Indian Embassy in Khartoum, the capital of Sudan, asked all nationals to stay indoors and take utmost precautions as gunshots and explosions rang out in various parts of the city following clashes between the army and the paramilitary forces.

Topic 22. POLAND AND UKRAINE BAN WHEAT IMPORT FROM UKRAINE

Important for the subject: International Relations

Poland and Hungary have decided to ban imports of grain and other food from neighbouring Ukraine.

Poland and Hungary have imposed a ban on **food grain from Ukraine until 30 June** including a **prohibition on imports of sugar, eggs, meat, milk and other dairy products and fruits and vegetables.**

The bans are a **result of the Russia-Ukraine war**.

- Fearing the worst consequences, the **European Union then lifted duties on grain from Ukraine** to ease distribution to those global markets. However, instead of the grain transiting seamlessly onto global markets, it has remained in Poland and caused a **grain glut.**

- This **grain glut has brought down the prices drastically**, causing **massive losses to the Polish farming community.**

- The **European Union** has **criticized bans by Poland and Hungary** on imports of Ukrainian grain and other foods over the weekend, saying the unilateral moves were **"unacceptable."**

More about European Union:

- The European Union is a **group of 27 countries** that operate as a **cohesive economic and political block.**

- It was **formed in 1993** after the **signing of the Maastricht Treaty** The European Union **Headquarters is located in Brussels,** Belgium

- The Maastricht Treaty is also known as the **Treaty of the European Union.** The Maastricht Treaty was **amended thrice**. The amendments are listed below.

Treaty of Amsterdam (1997)

Treaty of Nice (2001)

Treaty of Lisbon (2007)

The **objectives** of forming the European Union are listed below.

- To **increase political cooperation**

- To **enhance economic integration** by creating a **single currency, the EURO. Unified security and foreign policy Common citizenship** Rights Enhanced **cooperation in the areas of judiciary, immigration and asylum**

Topic 23. INDIA TO HOST TWO-DAY INTERNATIONAL BUDDHIST CONFERENCE

Important for the subject: International Relations

The **first Global Buddhist summit** is going to be **held in Delhi**. Buddhist monks and others from 30 countries are expected to attend the event.

Key-highlights of the Summit

- The **summit is being organized in conjunction with the International Buddhist Conference**, a non-governmental organization.

- The **International Buddhist Confederation (IBC),** an umbrella group that serves as a platform for Buddhists worldwide, is organizing the event.

Theme: '**Responses to contemporary challenges, philosophy to practice**'.

- Recently, India, which is the chair of the Shanghai Cooperation Organization (SCO) grouping, organized a meet on Buddhist heritage involving all the countries.

Vesak / Buddha Purnima

- Vesak is the most sacred day for Buddhists around the world. It is also known as **Buddha Purnima and Buddha Day.**

- **The day commemorates birth, enlightenment and Death** (or Parinirvana) of Lord Buddha, the founder of Buddhism, all of which is said to take have taken place on the same day.

- Vesak, falls on the full moon day (Purnima) of the month Vaishakha (May), hence the occasion is referred to as Buddha Purnima in India.

- **Recognition by United Nations (UN):** The General Assembly, by its resolution in 1999, recognized internationally the Day of Vesak. It was done to acknowledge the contribution that Buddhism made to humanity.

Topic 24. TAIWAN STRAIT

Important for the subject: International Relations

A U.S. warship sailed through the waters separating Taiwan and mainland China, days after Beijing staged war games around the island. Western Navies regularly conduct "freedom of navigation operations" to assert the international status of regional waterways such as the Taiwan Strait and the South China Sea.

About Taiwan Strait

- The Taiwan Strait is a 180-kilometer (110 mi)-wide **strait separating the island of Taiwan and continental Asia.**

- The **strait is part of the South China Sea** and **connects to the East China Sea to** the

Former names of the Taiwan Strait include the **Formosa Strait or Strait of Formosa**, from a dated name for Taiwan; **the Strait of Fokien or Fujian**, from the Chinese province forming the strait's western shore; and the **Black Ditch, a calque of the strait's name in Hokkien and Hakka.**

Geographical Features

- The entire strait is **on Asia's continental shelf**. The **Taiwan Strait is relatively shallow**. It has an average depth of about 490ft. **Rivers draining into it.** Several rivers including the **Jiulong and Min rivers from China's Fujian Province** drain into the **Taiwan Strait**.

Islands on the Taiwan Strait

- Several islands are located in the strait. **Kinmen and Matsu** are two of the largest and most significant islands in the strait located off the **Fujian coast of China.**
- The biggest islands along the Taiwan side **include Penghu (or Pescadores), Xiamen, and Pingtan.** The **Xiamen and Pingtan Islands are administered by the People's Republic of China**, while the other three islands: **Penghu (or Pescadores), Kinmen, and Matsu are under the administration of the Republic of China (Taiwan).**
- The **Penghu (or Pescadores) Island is the largest and most populous island in the Taiwan Strait.**

Topic 25. WTO PANEL

Important for the subject: International Relations

A World Trade Organization (WTO) panel said on Monday that India had violated global trading rules in a dispute with the European Union (EU), Japan and Taiwan over import duties on IT products

What is the dispute?

- In 2019, the EU challenged India's introduction of import duties of between 7.5% and 20% for a wide range of IT products, such as mobile phones and components, as well as integrated circuits, saying they exceeded the maximum rate. Japan and Taiwan filed similar complaints that same year.
- The EU is India's third largest trading partner, accounting for 10.8% of total Indian trade

in 2021, according to the European Commission.

- India's diplomatic mission in Geneva did not immediately respond to a request for comment on whether it would appeal against the ruling. If it does, the case will sit in legal purgatory since the WTO's top appeals bench is no longer functioning due to U.S. opposition to judge appointments.

- The WTO panel said that India had already brought some of the challenged tariffs into line with global trading rules since last year. While the panel broadly backed the complaints against India, it rejected one of Japan's claims that New Delhi's customs notification lacked "predictability".

Topic 26. WORLD FOOD PROGRAM IN SUDAN

Important for the subject: International relations

Three employees for the World Food Program (WFP), a UN body that delivers food assistance to vulnerable communities, were killed after the RSF and armed forces exchanged fire at a military base in Kabkabiya, in the west of the country.

What is happening in Sudan?

- **The fighting that has erupted in the Sudanese capital, Khartoum, and elsewhere in the country is a direct result of a vicious power struggle within the country's military leadership.**

- The clashes are between the regular army and a paramilitary force called the Rapid Support Forces (RSF).

Where is Sudan?

- Sudan is in north-east Africa and is one of the largest countries on the continent, covering 1.9 million square kilometres.
- It is also one the poorest countries in the world, with its 46 million people living on an **average annual income of $750 (£606) a head**.
- The population of Sudan is predominantly Muslim and the country's official languages are Arabic and English

Who is fighting who in Sudan?

- Since the **2021 coup**, Sudan has been run by a council of generals, led by the two military men at the centre of this dispute:
- **Gen Abdel Fattah al-Burhan**, the head of the armed forces and in effect the country's president,And his deputy and leader of the RSF, **Gen Mohamed HamdanDagalo**, better known as Hemedti.

World Food Program

- The World Food Programme is the world's largest humanitarian organization, saving lives in emergencies and using food assistance to build a pathway to peace, stability and prosperity for people recovering from conflict, disasters and the impact of climate change.
- As the international community has committed to end hunger, achieve food security and improved nutrition by 2030, one in nine people worldwide still do not have enough to eat.
- It was founded in 1961 by the Food and Agriculture Organization (FAO) and United Nations General Assembly (UNGA) with its headquarters in Rome, Italy.
- It is also a member of the United Nations Sustainable Development Group (UNSDG), a coalition of UN agencies and organizations aimed at fulfilling the Sustainable Development Goals (SDGs).
- The WFP assists 88 countries, and has assisted 97 million people (in 2019) which is the largest number since 2012.

It works closely with the other two Rome-based UN agencies:

- The Food and Agriculture Organization (FAO), which helps countries draw up policy and change legislation to support sustainable agriculture.The International Fund for

Agricultural Development (IFAD), which finances projects in poor rural areas.

- The WFP has no independent source of funds, it is funded entirely by voluntary donations. Its principal donors are governments, but the organization also receives donations from the private sector and individuals.

- The WFP has been awarded with the Nobel Prize for Peace 2020 for its efforts to combat hunger, bettering conditions for peace in conflict-affected areas and preventing the use of hunger as a weapon of war and conflict.

Report Released by WFP

- **Global Report on Food Crisis**– The Global Report on Food Crises describes the scale of acute hunger in the world. It provides an analysis of the drivers that are contributing to food crises across the globe.

- The report is produced by the Global Network against Food Crises, an international alliance working to address the root causes of extreme hunger.

Topic 27. INDIA TO APPEAL WTO PANEL RULING ON ICT IMPORT TARIFFS

Important for the subject: International Relations

India is **expected to appeal** a recent ruling by a **panel of the World Trade Organization (WTO)** on its imposition of tariffs on mobile phones and electronic components.

- The **dispute settlement** panel of the **World Trade Organization (WTO)** had ruled that **India had violated global trading** rules in a dispute with the European Union (EU), Japan and Taiwan over import duties on IT products.

- The **EU, Chinese Taipei (Taiwan) and Japan** d**ragged India to the WTO dispute in 2019** on imposing tariffs on certain information and communications technology goods.

- These products include mobile phones, microphones, transmission apparatus for radio broadcasting etc. As per these petitions, **India is signatory to the 1996 Information Technology Agreement (ITA).**

- Hence, it is required to **eliminate tariffs on a range of products, including mobile handsets.** Many countries had complained that the i**mposition of tariffs on IT products by India was against the principles** agreed upon under ITA.

What options does India have after the present WTO ruling?

- India has the **option to appeal** against the present ruling. **If India does so**, the **case will sit in legal purgatory** since the **WTO's top appeals bench is no longer functioning** due to **U.S. opposition to judge appointments**.

- Legal purgatory is a term used to **describe a situation where a legal case or dispute is in a state of limbo,** without resolution or a clear path forward.

What is Dispute Settlement Body of WTO:

- The General Council convenes as the **Dispute Settlement Body (DSB)** to deal with disputes between WTO members.

The DSB has **authority** to:

- Establish dispute settlement panels, Refer matters to arbitration, adopt panel, Appellate Body Maintain surveillance over the implementation of recommendations and rulings contained in arbitration reports, and Authorize suspension of concessions in the event of non-compliance with those recommendations and rulings.

Topic 28. HAKKI PIKKIS CAUGHT IN SUDAN CONFLICT

Important for the subject: International Relations

More than 181 members of the H**akkiPikki tribal community from Karnataka** are stuck in violence-hit Sudan,

Who are the HakkiPikki:

- The HakkiPikki is a tribe that lives in **several states in west and south India,** especially near forest areas.

- HakkiPikkis (**Hakki in Kannada means 'bird' and Pikki means 'catchers'**) are a **semi-nomadic tribe,** traditionally of bird catchers and hunters. According to the 2011 census, the **HakkiPikki population in Karnataka is 11,892.**

- They **live majorly in Davangere, Mysuru, Kolar, Hassan and Shivmogga districts.** In different regions, they are known by different names, such as **Mel-Shikari in northern Karnataka and Maharashtra.** The HakkiPikki**move in groups from place to place** in search of livelihood.

- They are **divided** into **four clans, called Gujaratia, Panwar, Kaliwala and Mewaras.**

These clans can be **equated with castes in the traditional Hindu society.**

- In the **olden days,** there was a **hierarchy among the clans**, with the **Gujaratia at the top** and the **Mewaras at the bottom.** Despite being surrounded by Dravidian languages and living in southern India, the **community speaks an Indo-Aryan language.**

- Their **mother tongue** was designated **'Vaagri'** by scholars. They communicate in 'Vaagri' at home **but speak in Kannada when conducting daily business. UNESCO has listed 'Vaagri'** as one of the **endangered languages.**

What were their traditional jobs, and what do they do now:

- Traditionally, **HakkiPikkis lived in forest areas**, leading a **nomadic life for nine months** a year and coming back to their **permanent camps for three.**

- Earlier, **men of the tribe would hunt while women begged** in villages. But as the wildlife protection laws became stricter, the HakkiPikkis in Karnataka **started selling spices, herbal oils, and plastic flowers in local temple fairs.** Later, they started **selling their products in Africa. Education levels** among the HakkiPikkis are **still low.**

What are their rituals and customs:

- HakkiPikkis in **Karnataka follow Hindu traditions** and celebrate all Hindu festivals.

- They are **non-vegetarian**s. The **eldest son** in a family is **not supposed to cut his hair** so that he can be identified easily.

- The tribe **prefers cross-cousin marriages**. According to locals, the usual age of marriage is 18 for women and 22 for men.

- The **society is matriarchal**, where the **groom gives dowry to the bride's family.**

Topic 29. C+C5 GROUPS

Important for the subject: International Relations

This week, China convened an **online meeting** of trade ministers of the grouping known as **C+C5 '**

What is C+C5 groupings:

- It is a group comprising **China and the five Central Asian republics, namely Uzbekistan, Kazakhstan, Tajikistan, Turkmenistan, and Kyrgyzstan.**
- The **first C+C5 summit** was held in **virtual format on January 25 last year**, to commemorate the **30th anniversary of diplomatic relations.**
- **Diplomatic relations** between China and Central Asian Countries were established in **January 1992**, and China's relationship with the region was institutionalized as the **Shanghai Five,** the **forerunner of the Shanghai Cooperation Organization** (SCO).

Topic 30. CRITICAL MINERALS

Important for the subject: International Relations

A recent working paper from Centre for Social and Economic Progress (CSEP) extends the

earlier minerals assessment for 23 minerals by assessing the criticality levels of 43 select minerals for India based on their economic importance (demand side factors) and supply risks (supply-side factors) which are determined through the evaluation of specific indicators.

Critical minerals

- **Critical minerals** refer to mineral resources, **both primary and processed, which are essential inputs in the production process of an economy**, and **whose supplies are likely to be disrupted due to the risks of non-availability or unaffordable price spikes**.
- To tackle such supply risks, major global economies periodically evaluate which minerals are critical for their jurisdiction through a quantitative assessment.

Examples:

- Minerals such as **antimony, cobalt, gallium, graphite, lithium, nickel, niobium, and strontium are among the 22 assessed to be critical for India**.

Significance for India:

- Many of these are required to meet the manufacturing needs of green technologies, high-tech equipment, aviation, and national defence.
- However, while India has a significant mineral geological potential, many minerals are not readily available domestically.
- Hence, India needs to develop a national strategy to ensure resilient critical minerals supply chains, which focuses on minerals found to be critical.

Applications:

- **Electric vehicles**: cobalt, lanthanum, lithium
- **Fuel cells**: platinum, palladium, rhodium
- **Wind energy technologies**: neodymium, dysprosium, terbium
- **Aviation sector**: titanium
- **Photovoltaic solar technologies**: cadmium, indium, gallium

Categorization:

- **Traditional** — titanium, vanadium

- **Sunrise —** lithium
- **Mixed use** — cobalt, nickel, graphite, light rare earth elements (LREEs), heavy rare earth elements (HREEs).

Minerals Security Partnership (MSP)

- In 2022, the **US and 10 other nations** — Australia, Canada, Finland, France, Germany, Japan, the Republic of Korea (South Korea), Sweden, the United Kingdom, and the European Commission — came together in a bid to **break**
- **China's dominance in the global market of rare earth minerals** and formed the **Minerals Security Partnership (MSP).**

Objective:

- The **goal of the MSP** is to ensure that critical minerals are produced, processed, and recycled in a manner that supports the ability of countries to realize the full economic development benefit of their geological endowments.
- Focus would be on the supply chains of minerals such as **Cobalt, Nickel, Lithium** and also the **17 "rare earth" minerals.**

G7's Sustainable Critical Minerals Alliance

- Canada, along with Australia, France, Germany, Japan, the United Kingdom and the United States, launched the Sustainable Critical Minerals Alliance to drive the global uptake of environmentally sustainable and socially inclusive and responsible mining, processing and recycling practices and responsible critical minerals supply chains.

Topic 31. INDIA LINES UP EVACUATION IN SUDAN

Important for the subject: International Relations
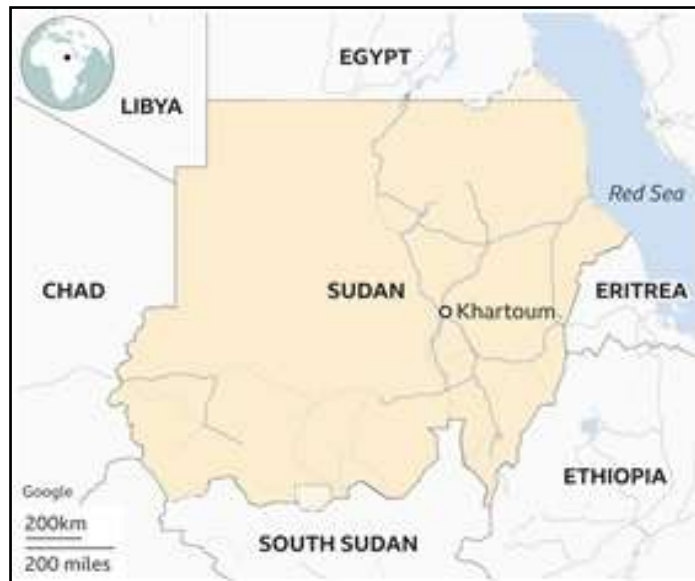
India began preparations for the evacuation of an estimated 3,000 Indian nationals presently situated in different parts of Sudan which has seen intense fighting between the army and a paramilitary force for a week now.

- In Sudan, powerful rival military factions are battling for control. The fight is between the army and the powerful paramilitary group, the Rapid Support Forces (RSF).
- Both groups were allies. Together, they seized power in a 2021 coup. But tensions increased over the proposed integration of the RSFinto the military.
- The key question is who is in control and who would be the military's commander-inchief during an integration period.
- **Main players on the ground:** Since the 2021 coup, Sudan has been run by a council of generals, led by the two military men at the center of this dispute: Gen Abdel Fattah al-Burhan, the head of the armed forces and in effect the country's president
- And his deputy and leader of the RSF, Gen Mohamed HamdanDagalo, better known as Hemedti. They have disagreed on the direction the country is going in and the proposed move towards civilian rule.
- The main sticking points are plans to include the 100,000-strong RSF into the army, and who would then lead the new force.

Rapid Support Forces

- The RSF was formed in 2013 and has its origins in the notorious Janjaweed militia that brutally fought rebels in Darfur, where they were accused of ethnic cleansing.

- Since then, Gen Dagalo has built a powerful force that has intervened in conflicts in Yemen and Libya. He has also developed economic interests including controlling some of Sudan's gold mines.

- The RSF has been accused of human rights abuses, including the massacre of more than 120 protesters in June 2019.

- Such a strong force outside the army has been seen as a source of instability in the country.

About Sudan

- Sudan is in **north-east Africa** and is **one of the largest countries on the continent**, covering 1.9 million square kilometers. It is also one the poorest countries in the world, with its 46 million people living on an average annual income of $750 (£606) a head.

- The population of Sudan is **predominantly Muslim and the country's official languages are Arabic and English.**

- Sudan **borders the Red Sea, the Sahel region and the Horn of Africa.** Its strategic location and agricultural wealth have attracted regional power plays, complicating the chances of a successful transition.

Topic 32. FAITH IN CHILDREN'S VACCINES HAS GONE UP IN INDIA, SAYS UNICEF

Important for the subject: International Relations

According to the data collected by **The Vaccine Confidence Project and published by UNICEF**, **out of the 55 countries studied, only China, India, and Mexico showed improvement in the popular perception of the importance of vaccines for children.**

- As per the data, vaccine confidence has been on a decline in countries such as Japan, the Republic of Korea, Papua New Guinea, Ghana, and Senegal.

- The report also noted that the growing threat of vaccine hesitancy was mainly due to factors such as misleading information and declining trust in vaccine efficacy.

- Further, **UNICEF India has released its global flagship report titled "The State of the World's Children 2023: For Every Child, Vaccination**" which underlines the importance of childhood immunization.

- The report pointed out that about 67 million children missed out on vaccinations between 2019 and 2021 and the vaccination coverage levels decreased in 112 countries.

- The decline in vaccine coverage has been mainly attributed to intense demands on health systems, the diversion of immunization resources to COVID-19 vaccination, health worker shortages and stay-at-home measures.

About UNICEF

- UNICEF is a **special program of the United Nations (UN**) devoted to aiding national efforts to improve the health, nutrition, education, and general welfare of children.

- UNICEF was created in 1946as International Children's Emergency Fund (ICEF) by UN relief Rehabilitation Administration to help children affected by World War II.

- UNICEF became a **permanent part of the United Nations in 1953**. The name was shortened to United Nations Children Fund but it is still referred to as UNICEF.

- It is **mandated by the United Nations General Assembly** to advocate for the protection of children's rights, to help meet their basic needs and to expand their opportunities to reach their full potential.

UNICEF is **guided by the Convention on the Rights of the Child, 1989.**

- It strives to establish children's rights as enduring ethical principles and international standards of behaviour towards children.

- Awarded the Nobel Prize for Peace in 1965 for "promotion of brotherhood among the nations".

Headquarters: New York City

- It works in over 190 countries and territories with 7 regional offices.

- **UNICEF is governed by an Executive Board consisting of 36 members that are elected to terms of three years by the United Nations' Economic and Social Council**.

Topic 33. BEIJING ACCORD

Important for the subject: International Relations

Iran and Saudi Arabia, who have been in conflict directly and indirectly since the rise of the Arab Spring in 2011 have agreed to resume diplomatic relations and reopen embassies within two months.

The agreement came after Chinese-brokered talks in Beijing.

- On March 10, 2023, **Iran, Saudi Arabia and China announced an agreement had been reached covering a resumption of diplomatic relations between the Kingdom of Saudi Arabia and the Islamic Republic of Iran.**
- The **three countries also announced a re-opening of their embassies** and missions within a period not exceeding two months.
- The announcement was significant and surprised the US and Israel who had been attempting to build a regional coalition against Iran.
- The agreement affirmed their respect for the sovereignty of states and noninterference in the internal affairs of states.
- The deal, brokered by China, also **included the implementation of a security cooperation agreement signed in 2001 and a 1998 pact to enhance cooperation on trade, investment, technology, and culture.**

Topic 34. MHA CANCELS OCI STATUS OF ACTOR

Important for the subject: Polity

The **Union Home Ministry has cancelled the Overseas Citizen of India (OCI) card** issued to Kannada actor Chetan A Kumar for "anti-India activities". as per the notice, issued by **Foreigners Regional Registration Office** (FRRO).

Overseas Citizen of India

- In 2000, the **Union Ministry of External Affairs** under the **Chairmanship of L.M. Singhvi set up a High-Level Committee on the Indian Diaspora.**
- The Committee was asked to make a comprehensive study of the global Indian Diaspora and to recommend measures for a constructive relationship with them.

- The committee recommended the amendment of the Citizenship Act (1955) to provide for the grant of dual citizenship to Persons of Indian Origin (PIOs) belonging to certain specified countries.

- The **Citizenship (Amendment) Act 2003, made provision for the acquisition of Overseas Citizenship of India (OCI)** by the PIOs of 16 specified countries other than Pakistan and Bangladesh.

- The **Citizenship (Amendment) Act 2005 expanded the scope of the grant of OCI for PIOs of all countries except Pakistan and Bangladesh** as long as their home countries allow dual citizens under their local laws. **The OCI is not dual citizenship as the Indian Constitution** under Article 9 forbids dual citizenship or dual nationality.

- The **Citizenship (Amendment) Act, 2015**, has introduced a new scheme called "**Overseas Citizen of India Cardholder**" by **merging the PIO card scheme and the OCI card scheme.**

Why the OCI and PIO merged?

- The PIO card scheme was introduced in 2002 and thereafter the OCI card scheme was introduced in 2005. Both the schemes were running in parallel even though the OCI card scheme had become more popular.

- This was causing unnecessary confusion in the minds of applicants. The government accepted the problems being faced by applicants and to provide enhanced facilities to them, the Indian Government formulated one single scheme after merging the PIO and OCI schemes, containing positive attributes of both.

- For achieving the above objective, the Citizenship (Amendment) Act, of 2015, was enacted. The Citizenship (Amendment) Act, of 2015, replaced the nomenclature of "Overseas Citizen of India" with that of "Overseas Citizen of India Cardholder". **Rights of Overseas Citizens of India Cardholder** An overseas citizen of India cardholder shall be entitled to such rights, as the Central Government may specify.

- An **overseas citizen of India cardholder shall not be entitled to the following rights** (which are conferred on a citizen of India); He shall not be entitled to the right to equality of opportunity in matters of public employment. He shall not be eligible for election as President.

- He shall not be eligible for election as Vice-President. He shall not be eligible for appointment as a Judge of the Supreme Court. He shall not be eligible for appointment as

a Judge of the High Court. He shall not be entitled to register as a voter. He shall not be eligible for being a member of the House of the People or the Council of States.

- He shall not be eligible for being a member of the State Legislative Assembly or the State Legislative Council.

- He shall not be eligible for appointment to public services and posts in connection with affairs of the Union or of any State except for appointment in such services and posts as the Central Government may specify.

Renunciation of Overseas Citizen of India Card

- If any overseas citizen of India cardholder makes a declaration renouncing the Card registering him as an overseas citizen of India cardholder, the declaration shall be registered by the Central Government, and upon such registration, that person shall cease to be an overseas citizen of India cardholder.

- Where a person ceases to be an overseas citizen of India cardholder, the spouse of foreign origin of that person, who has obtained an overseas citizen of India card and every minor child of that person registered as an overseas citizen of India cardholder shall subsequently cease to be an overseas citizen of India cardholder.

Cancellation of Registration as an Overseas Citizen of India Cardholder

- The Union Government may cancel the registration of a person as an overseas citizen of India cardholder if it is satisfied that; The registration as an overseas citizen of India cardholder was obtained through fraud, false representation or the concealment of any material fact; or

- The overseas citizen of India cardholder has shown disaffection towards the Constitution of India; or The overseas citizen of India cardholder has, during any war in which India may be engaged, unlawfully traded or communicated with an enemy; or

- The overseas citizen of India cardholder has, within five years after registration, been sentenced to imprisonment for a term of not less than two years; or It is necessary so to do in the interests of the sovereignty and integrity of India, the security of India, friendly relations of India with any foreign country, or in the interests of the general public.

Topic 35. COLLECTING VOICE SAMPLES TO AID INVESTIGATION: PROCESS AND LEGALITY

Important for the subject: Polity

Congress Leader JagdishTytler has appeared before the CBI to submit samples of his voice as part of the investigation into his alleged role in three murders in Delhi's PulBangash area by a mob during the anti-Sikh violence of 1984.

How is a voice sample taken?

- The sample is **collected under controlled circumstances,** following specific procedures. A voice sample is generally **taken in an echo-proof room** for a controlled and **noise free environment** and a voice recorder is used.

- The Important for the subject is **asked to say a small part of the original statement** that is already part of the evidence, and **both vowels and consonants** in the spoken sample are analyzed. Certain **technical parameters** are kept in mind while **collecting the voice sample**.

- A **spectral analysis of the audio speech** is undertaken where the **pitch, energy, and frequency of the voice are kept** as the base to study and match with the original audio sample

- There are two ways in which a comparison is made Firstly, The **semi-automatic spectrographic** method" of voice sampling — that **uses an instrument that converts speech signals into a visual display** — while some other countries use the **"automatic method" where a likelihood ratio of the voice samples is developed**, which increases accuracy

Legality to collect voice samples of a suspect or accused

- India's **criminal procedure laws do not contain a specific provision** for testing voice samples because it is a relatively new technological tool.

- **Section 53** of the **Code of Criminal Procedure (CrPC), 1973**, allows examination of accused by a medical practitioner at the request of a police officer.

- The word **"examination"** includes the **examination of blood, blood stains, semen,**

swabs in case of sexual offenses, sputum and sweat, hair samples and fingernail clippings by the use of modern and scientific techniques including **DNA profiling** and such other tests which the registered medical practitioner thinks necessary in a particular case".

- The phrase **"such other tests"** is read to **include the collection of voice samples**.

- In a **2013** case, the **Supreme Court** considered **whether compelling an accused** to give his **voice sample in the course of an investigation** would be **violative of the fundamental** right against **self-incrimination** or the **right to privacy.** While delivering a **Split Verdict** in the case, the **SC acknowledged that there is no specific law** for collection of voice samples

- In a ruling on **March 30, 2022**, the **Punjab and Haryana High Court** observed that **voice samples** in a sense resemble fingerprints and handwriting, each person has a distinctive voice with characteristic features. The **sample taken itself would not be an evidence, rather they are for comparing the evidence already collected.**"

Topic 36. SAME-SEX MARRIAGE'S LEGAL RECOGNITION IN INDIA

Important for the subject: polity

The Supreme Court has set up a five-judge Constitution bench to hear the batch of petitions seeking legal recognition of same-sex marriages in India.

The bench set up by Chief Justice of India (CJI) DY Chandrachud also includes Justices Sanjay KishanKaul, RavindraBhat, HimaKohli, and PS Narasimha.

What is the case?

- The Court has been hearing multiple petitioners' requests for legal recognition of same-sex marriages under a special law.

- SC took up the case as petitioners claimed that **the non-recognition of same-sex marriage amounted to discrimination t**hat strikes at the root of dignity and selffulfilment of LGBTQIA+ couples.

- The **petitioners cited the Special Marriage Act, 1954** and appealed to the Court to extend the right to the LGBTQIA+ community, **by making the marriage between any two persons gender neutral.**

- **Special Marriage Act, 1954 provides a civil marriage for couples who cannot marry**

under their personal law.

Why does the community want this right?

- Even if LGBTQIA+ couples may live together, legally, they are on a slippery slope.
- In Navtej Singh Johar case (2018) **homosexuality was decriminalised**. They **do not enjoy the rights married couples do.** For example, LGBTQIA+ couples **cannot adopt children or have a child by surrogacy**;
- They **do not have automatic rights to inheritance, maintenance** and **tax benefits**; after a partner passes away, they **cannot avail of benefits like pension or compensation.**
- Most of all, since marriage is a social institution – that is created by and highly regulated by law – without this social sanction, same-sex couples struggle to make a life together.

What is the Centre's stand?

- At depositions in courts and outside, the **Centre has opposed same-sex marriage.**
- It said that the judicial interference will cause complete havoc with the delicate balance of personal laws.
- While filing a counter-affidavit during this hearing, the **government said that decriminalization of Section 377 IPC does not give rise to a claim to seek recognition for same-sex marriage.**

Arguments forwarded by the Government Notion of marriage:

- The notion of marriage itself necessarily and inevitably presupposes a union between two persons of the opposite sex.
- This definition is socially, culturally and legally ingrained into the very idea and concept of marriage and ought not to be disturbed or diluted by judicial interpretation.

Marriage laws governed by the personal laws/codified laws:

- Parliament has designed and framed the marriage laws in the country to recognize only the union of a man and a woman to be capable of legal sanction, and thereby claim legal and statutory rights and consequences.
- Marriage laws in India are mostly **governed by the personal laws/codified laws relatable to customs of various religious communities.**
- Any interference with the same would cause a complete havoc with the delicate balance

of personal laws and in accepted societal values.

Reasonable restriction:

- Even if such a right is claimed under Article 21, the right can be curtailed by competent legislature on permissible constitutional grounds including legitimate state interest.

Special Marriage Act, 1954

- Marriages in India can be registered under the respective personal laws Hindu Marriage Act, 1955, Muslim Marriage Act, 1954, or under the Special Marriage Act, 1954.
- The **Special Marriage Act, 1954 is an Act of the Parliament of India** with provision for **civil marriage for people of India and all Indian nationals** in **foreign countries, irrespective of religion or faith followed by either party.**
- When a person solemnized marriage under this law, then the marriage is not governed by personal laws but by the Special Marriage Act.

Topic 37. NINTH SCHEDULE OF CONSTITUTION

Important for the subject: Polity

Chhattisgarh Chief Minister Bhupesh Baghel wrote to Prime Minister NarendraModi seeking the inclusion of two amendment Bills allowing for higher quota in jobs and educational institutions, in the Ninth Schedule of the Constitution.

In Chhattisgarh's case, the two amendment Bills — that pave the way for 76% quota for Scheduled Caste, Scheduled Tribes and Other Backward Classes — were passed unanimously by the State Assembly last December, but are yet to receive the Governor's nod.

Ninth Schedule

- The Schedule **contains a list of central and state laws** which cannot be challenged in courts and was **added by the Constitution (First Amendment) Act, 1951**.
- The **first Amendment added 13 laws to the Schedule**. Subsequent amendments in various years have taken the number of protected laws to 284 currently.
- It was **created by the new Article 31B, which along with Article 31A was brought in by the government to protect laws related to agrarian reform** and for **abolishing the Zamindari system.**

- While **Article 31A extends protection to 'classes' of laws, Article 31B shields specific laws or enactments.** While most of the laws protected under the Schedule concern agriculture/land issues, the **list includes other Important for the subjects.**

- **Article 31B also has a retrospective operation** which means that if laws are inserted in the Ninth Schedule after they are declared unconstitutional, they are considered to have been in the Schedule since their commencement, and thus valid.

- **Although Article 31B excludes judicial review, the apex court has said in the past that even laws under the Ninth Schedule would be open to scrutiny** if they violated Fundamental Rights or the basic structure of the Constitution.

Are Laws in the Ninth Schedule completely Exempt from Judicial Scrutiny?

- **KeshavanandaBharati v. State of Kerala (1973**): The court upheld the judgement in Golaknath and introduced a new concept of "Basic structure of the Indian Constitution" and stated that, "all provisions of the constitution can be amended but those amendments which will abrogate or take away the essence or basic structure of constitution which included Fundamental Rights are fit to be struck down by the court".

- **Waman Rao v. Union of India (1981**): In this important judgement, the SC ruled that, "those amendments which were made in the constitution **before 24th April 1973** (date on which judgement in KeshavanandaBharati was delivered**) are valid** and constitutional **but those which were made after the stated date are open to being challenged on the ground of constitutionality.**

- **I R Coelho v. State of Tamil Nadu (2007**): It was held that **every law must be tested under Article 14, 19 and 21 if it came into force after 24th April 1973.**

- In addition, the court upheld its previous rulings and declared that any act can be challenged and is open to scrutiny by the judiciary if it is not in consonance with the basic structure of the constitution.

- In addition, it was held that if the constitutional validity of any law under the ninth schedule has been upheld before, in future it cannot be challenged again.

Topic 38. KEY SC VERDICTS THAT MOVED THE NEEDLE ON LGBTQ RIGHTS

Important for the subject: Polity

Recently, the Supreme Court started to hear a batch of pleas seeking legal recognition for

same-sex marriages. On the second day of the hearing, the court heard arguments on the changing legal landscape on LGBTQ rights and the evolution of the right to choose one's partner.

Key SC Verdicts

NALSA v Union of India

- In 'NALSA', the Court agreed with virtually the same arguments it rejected in Suresh Koushal case.
- The Supreme Court in 'Suresh Koushal v Union of India' upheld the constitutional validity of Section 377 of the Indian Penal Code.

The **Section 377 of the IPC was an act that criminalised homosexuality**.

- In this case, the **court upheld the right of transgender persons to decide their gender.**
- It directed the Centre and state governments to grant legal recognition to their gender identity, such as male, female or the third gender.

KS Puttaswamy v Union of India

- In this case, in 2017, a nine-judge Bench of the Supreme Court unanimously recognized the right to **privacy as a fundamental right under the Constitution**.
- In this judgement, the apex court observed that the rights of LGBT population are real rights founded on sound constitutional doctrine. They inhere in the right to life. They dwell in privacy and dignity. They constitute the essence of liberty and freedom.

ShafinJahan v Union of India

- The SC in March 2018 set aside a Kerala High Court judgment that annulled the marriage of a 24-year-old woman who converted to Islam and married a man of her choice.
- The **ruling recognized the right to choose one's partner as a facet of the fundamental right to liberty and dignity.**

Shakti Vahini v Union of India

- A three-judge Bench on the SC in March 2018 issued directives to prevent honour killings at the behest of khappanchayats.

- It also issued directives to protect persons who marry without the approval of the panchayats. In the ruling, the **Apex Court recognized the right to choose a life partner as a fundamental right.**

- SC observed that – when two adults consensually choose each other as life partners, it is a manifestation of their choice which is recognized under Articles 19 and 21 of the Constitution.

NavtejJohar v Union of India

- In August 2018, the SC heard a curative petition against the 'Koushal' ruling. A **five-judge Constitution Bench struck down IPC Section 377 to the extent that it criminalised homosexuality**.

- The Navtej ruling essentially said that the LGBTQ community are equal citizens and underlined that there cannot be discrimination in law based on sexual orientation and gender.

Deepika Singh vs Central Administrative Tribunal

- The SC in August last year decided in favour of a woman who was denied maternity leave for her first biological child on the ground that she had already availed the benefit for her two non-biological children.

- The **ruling recognised atypical families, including queer marriages, which could not be confined in the traditional parenting roles.**

Topic 39. SC SLAMS SECTIONS OF SPECIAL MARRIAGE ACT

Important for the subject: Polity

The Supreme Court said **provisions of the Special Marriage Act which mandate a 30 day notice of intent to marry is steeped in patriarchy and expose vulnerable couples to an "invasion" by society.**

Sections of the act

- **Section 5** of the SMA requires couples getting married under it to give a notice to the Marriage Officer 30 days before the date of marriage**.**

- **Section 6** requires such a notice to be then entered into the Marriage Notice Book

maintained by the Marriage Officer, which can be inspected by "any person desirous of inspecting the same.

- **Section 7** provides the process for making an objection.

- **Section 8** specifies the inquiry procedure to be followed after an objection has been submitted. These **provisions seriously damage one's right to have control over her/his personal information and its accessibility.**

- By making the personal details of the couple accessible to everyone, the very right of the couple to be the decision makers of their marriage is being hampered by the state.

- These public notices have been used by anti-social elements to harass couples getting married. There have been instances where marriage officers have gone over and beyond the law and sent such notices to the parents of the couple leading to the girl being confined to her house by her parents.

Special Marriage Act (SMA), 1954

- Marriages in India can be registered under the **respective personal laws Hindu Marriage Act, 1955, Muslim Marriage Act, 1954, or under the Special Marriage Act, 1954.**

- It is the duty of the Judiciary to ensure that the rights of both the husband and wife are protected.

- The **Special Marriage Act, 1954 is an Act of the Parliament of India with provision for civil marriage for people of India and all Indian nationals in foreign countries, irrespective of religion or faith followed by either party.**

- When a person solemnises marriage under this law, then the marriage is not governed by personal laws but by the Special Marriage Act.

Features:

- Allows people from two different religious backgrounds to come together in the bond of marriage.

- Lays down the procedure for both solemnization and registration of marriage, where either of the husband or wife or both are not Hindus, Buddhists, Jains, or Sikhs.

- Being a secular Act, it plays a key role in liberating individuals from traditional requirements of marriage.

Provisions:

Prior notice:

- As per Section 5 of the Act Couples have to serve a notice with the relevant documents to the Marriage Officer 30 days before the intended date of marriage.

Registration:

- Both parties are required to be present after the submission of documents for issuance of public notice inviting objections.
- Registration is done 30 days after the date of notice after deciding any objection that may have been received during that period by the SDM.
- Both parties along with three witnesses are required to be present on the date of registration.

Topic 40. TN ASSEMBLY AMENDS FACTORIES ACT 1948

Important for the subject :Polity

Tamil Nadu Assembly passed an amendment to the Factories Act, 1948, to enable exemption to industries from the present norms on maximum work hours, holidays and overtime wages as defined in the Act.

According to the amendment, the exemption can be provided by the government through a notification to "any factory or a group or class or description of factories" for certain period, Important for the subject to any conditions or restrictions mentioned in the notification. This exemption will mean some industries can enable their workers to work longer hour.

Factories Act 1948:

- The Factories Act, 1948, as amended by the Factories (Amendment) Act, 1987, serves to assist in **formulating national policies in India with respect to occupational safety and health in factories and docks in India**.
- It deals with various problems concerning **safety, health, efficiency and wellbeing of the persons at work places.**

Salient features of Factories Act, 1948

- The word "factory" has been expanded by the Factories (Amendment) Act of 1976 to include contract labour when determining whether a factory has a maximum of 10 or 20 employees.

- The Act increased the minimum age for children to work in workplaces from 12 to 14 and reduced their daily working hours from 5 to 4 and a half.

- The Act forbids women and children from working in factories from 7 p.m. to 6 a.m. The difference between a seasonal and non-seasonal factory has been abolished by the Act.

- The Act, which has **provisions for factory registration and licencing**. The **state government is required to make sure that all factories are registered and also have valid licences**that are renewed from time to time.

- The Act gives **state governments the authority to enact rules and regulations** that ask for management and employee association for the benefit of employees.

- The **state government has the authority to apply the Act's requirements to any establishment, regardless of the number of employees** inside and regardless of whether the establishment engages in manufacturing operations.

- In Rabindra Agarwal v. State of Jharkhand (2010), the **Jharkhand High Court held that the Factories Act, special legislation would prevail over the Indian Penal Code.**

Application of the Factories Act,1948

- The **Act also applies to the whole country of India**, and **covers all manufacturing processes and premises that fall under the definition of a factory** as defined in Section 2(m) of the Act.

- It also **applies to factories owned by the central or state governments**, as defined in Section 116 of the Act.

- The Act is applied and limited to factories that use power and employ 10 or more people on any working day in the preceding 12 months.

- The Act is applied and limited to factories that do not use power and employ 20 or more people on any working day in the preceding 12 months.

- The Act is also covered under Section 85 of the Factories Act by the state governments or Union Territories.

Topic 41. EC SHOULD KEEP POLITICAL PARTIES IN LOOP ABOUT DEFECTIVE VVPATS: CONGRESS

Important for the subject: Polity

The Congress slammed the Election Commission (EC) for not keeping political parties in loop as reports emerge that the EC has identified 6.5 lakh Voter Verified Paper Audit Trail (VVPAT) machines as defective.

- The Voter Verifiable Paper Audit Trail (VVPAT) is a method of providing feedback to voters using a ballot less voting system.
- The VVPAT is an independent printer system attached with Electronic Voting Machine (EVM) that allows the voters to verify that their votes are cast as intended.
- It generates a paper slip every time a voter casts his vote, recording the party to whom the vote was made. The VVPAT slip is kept in a sealed cover.
- VVPAT slip counting takes place in the VVPAT counting booths under the close monitoring of the returning officer and direct oversight of the observer.

How does the VVPAT work?

- The voting in India is done using the Electronic Voting Machine (EVM) that is designed with two units: the control unit and the balloting unit.
- The balloting unit of the machine has a list of candidate names and party symbols with a blue button next to it. The voter can press the button next to the candidate's name they wish to vote for.
- When the voter casts the vote on the EVM, printer-like VVPAT apparatus linked to the EVM generates a slip showing serial number, name and symbol of the candidate to whom the vote was made.
- With this slip, the voter can verify his casted vote. This VVPAT slip is displayed for 7 seconds before it's automatically cut.
- The slip, once viewed, is cut and dropped into the drop box in the VVPAT machine and a beep will be heard.
- The VVPAT machines can only be accessed by the election officers in the rarest of rare cases.

Topic 42. OSELTAMIVIR-RESISTANT H1N1 VIRUS

Important for the subject: Science and technology

Oseltamivir-resistant H1N1 virus can transmit from wild ducks to chickens. When the influenza burden is high during certain years, the amount of antiviral oseltamivir used will be high. Much of it **enters the water system** and will **end up driving antiviral resistance in avian viruses**.

- Previous work has demonstrated that influenza virus can **develop resistance to oseltamivir carboxylate** (OC) when the virus infects wild ducks that are **exposed to environmental-like OC concentrations** suggesting that environmental resistance is a concern.

- Avian influenza strain H1N1 with the **OC resistance mutation** (NA-H274Y) has been found **to retain resistance even when the environment did not contain oseltamivir carboxylate**, suggesting maintained fitness of the virus.

- If wild birds, **wild ducks** in particular, are the **first to be infected by influenza virus** brought in by migratory birds, **domestic poultry act as an important amplifying host**, and a source of influenza virus evolution. The **virus that has evolved can then spread from poultry birds to humans.**

- A study recently published in the Journal of General Virology has demonstrated that oseltamivir-resistant strain can transmit from wild ducks to chickens and then spread between chickens, while **retaining the resistance mutation** in an experimental setting mimicking conditions suitable for natural transmission.

- Results demonstrate that regardless of the oseltamivir-resistance mutation, infection was detected in experimentally-infected chickens and chickens in contact with infected mallards.

- According to the authors, this **may be due to poor species adaptation** of the virus. Researchers found that mutation (NA-H274Y) that renders the **virus resistant to oseltamivir carboxylate can remain stable in an environment even when oseltamivir carboxylate was not present.**

- And there is **no barrier to interspecies transmission** of the antiviral-resistant virus per se, thus demonstrating a risk of an oseltamivir-resistant pandemic virus.

- The study turns the spotlight on **responsible use of oseltamivir and surveillance for**

resistance development to limit the risk of an oseltamivir-resistant pandemic strain.

Oseltamivir

- Oseltamivir is an antiviral medication used in the treatment and prophylaxis of **influenza A and B.**
- It belongs to the class of neuraminidase inhibitors, **which work by blocking the action of the viral enzyme neuraminidase.** This **prevents the release of new viruses from infected cells**, and helps to reduce the severity and duration of influenza symptoms.
- The **Centers for Disease Control and Prevention** (CDC) recommends that clinicians use their discretion to **treat those at lower risk who present within 48 hours of first symptoms of infection**
- It is also sometimes **used in the prevention of influenza in people who have been exposed to the virus but are not yet showing symptoms**.

Topic 43. MAGNETORESISTANCE

Important for the subject: science and technology
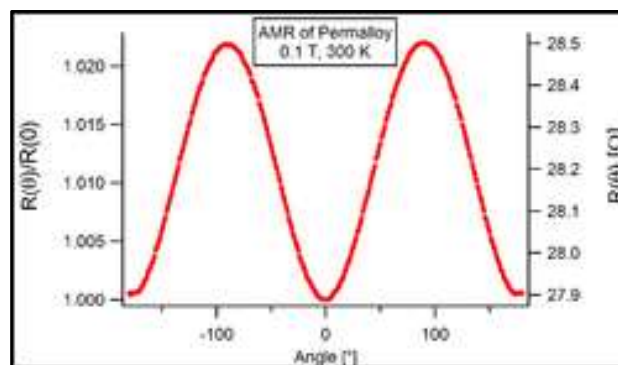
Recently, researchers in the UK, led by Nobel laureate Andre Geim have found that graphene displays an anomalous giant magnetoresistance (GMR) at room temperature.

Magnetoresistance:

- GMR is the **result of the electrical resistance of a conductor being affected by magnetic fields** in adjacent materials.
- Say a **conductor is sandwiched between two ferromagnetic materials** (commonly, metals attracted to magnets, like iron). When the **materials are magnetised** in **the same direction**, the **electrical resistance in the conductor is low**. When the **directions are**

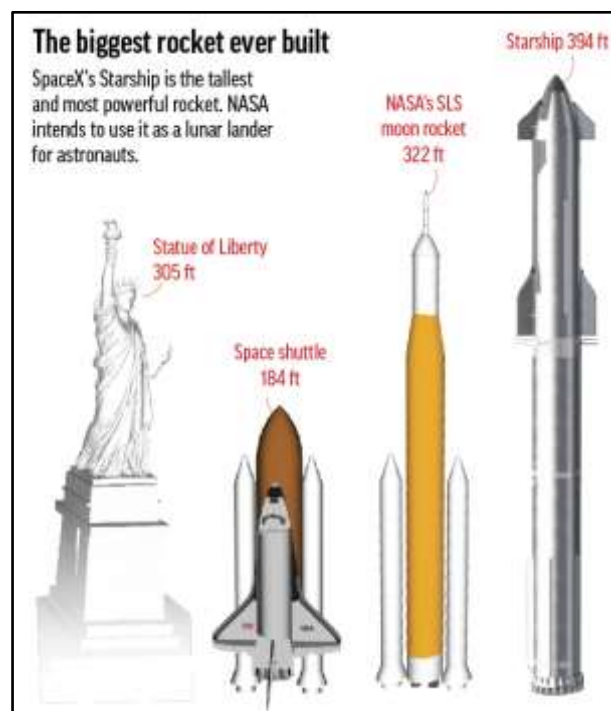**opposite each other**, the **resistance increases**.

- This is GMR. GMR-based devices are particularly **used to sense magnetic fields.** It is **used in harddisk drives and magnetoresistive RAM in computers**, biosensors, automotive sensors, microelectromechanical systems, and medical imagers.

- The **2007 Nobel Prize in Physics** was awarded to Albert Fert and Peter Grünberg for the discovery of GMR

Findings of the Study:

- In their study, the magnetoresistance in monolayer graphene at 27º C held between two layers of boron nitride increased by 110% under a field of 0.1 tesla. To compare, the magnetoresistance in these conditions increases by less than 1% in normal metals.

- The **magnetoresistance observed in the graphene-based device was almost 100-times higher** than that observed in other known semimetals in this magnetic field range

- The new study has found that a **graphene-based device**, unlike conventional counterparts, **wouldn't need to be cooled to a very low temperature to sense these fields.**

Topic 44. WHAT TO KNOW ABOUT FIRST TEST FLIGHT OF SPACEX'S BIG STARSHIP

Important for the subject: Science and Technology

The biggest rocket ever built. SpaceX's Starship is the tallest and most powerful rocket. NASA intends to use it as a lunar lander for astronauts. Statue of Liberty 305 ft. Space shuttle 184 ft. NASA's SLS moon rocket 322 ft. Starship 394 ft.

Elon Musk's SpaceX is about to launch the first test flight of its mammoth Starship. It's the biggest and mightiest rocket ever built, with the lofty goals of ferrying people to the moon and Mars.

About SpaceX Starship:

- Starship is a fully reusable spacecraft designed and built by SpaceX with the primary goal of sending humans to the Moon, Mars, and beyond.

Key objectives

- **SpaceX** aims to use Starship to establish a **self-sustaining human settlement on Mars.**
- The ultimate goal is to enable humans to become a multi-planetary species. It also aims to make Starship reusable, reducing the cost of spaceflight and bringing down the price to a few million dollars per flight.
- In the long run, the company aims to achieve full and rapid reusability of the spacecraft.

Features:

Design and configurability:

- **Made up of two parts:** a **50-meter tall spacecraft** and a **70-meter tall Super Heavy rocket booster.**
- Spacecraft has **six Raptor engines;** Super Heavy Booster has 28 Raptor engines. **Payload capacity** of up to **250 metric tons** and features a large heat shield. Interior can be configured for **up to 100 passengers or cargo.**

Manoeuvrability

- Designed to be **fully reusable**, with **vertical take-off and landing on Earth**, **Moon, and Mars.**
- Can be refuelled in orbit for deeper space travel and for establishing a human settlement on Mars.

Construction and materials

- Built using durable and cost-effective stainless steel material. Stainless steel also provides heat protection during re-entry into the Earth's atmosphere.

Power and thrust:

- The **stainless steel Starship** has **33 main engines**. Powered by **methane and liquid oxygen** fueled Raptor engines.
- Generates 17 million pounds of thrust more than twice that of the Saturn V rockets used for the Apollo missions.

Other competitors:

- **Jeff Bezos' Blue Origin** is readying the **New Glenn rocket** for its orbital debut from Cape Canaveral, Florida.
- **United Launch Alliance** expects its new **Vulcan rocket** to make its inaugural launch later this year, hoisting a **private lunar lander to the moon** at NASA's behest. **Europe's Arianespace** is close to launching its new, upgraded **Ariane 6 rocket** from French Guiana in South America.

Topic 45. EPIGENERES BIOTECH OPERATIONALISE THE HRC TEST – AN EARLY WARNING SYSTEM THAT PICKS UP CANCER SIGNALS

Important for the subject: Science and Technology

An **early warning system for cancer,** that's the promise of **HrC** or the **Himanshu Roy Cancer test** – a **first-of-its-kind prognostic test for cancer.**

- **I**t was **developed by** the city-based **Epigeneres Biotechnology** along with **Singapore-based Tzar Labs,** supported by some marquee investors.
- The test is named after mumbai's top cop Himanshuroy. The test involves a **single blood test** that claims to **detect the absence, imminence or presence of cancer.**
- The **test detects all cancers** from a blood test; it catches imminent cancer "very early" and it's "very accurate" of the "stage zero" test that detects a potential cancer risk 18 months earlier, the company claims.
- The test has been launched in India, priced at **sub-₹10,000.** With a capacity of **15 samples daily** the aim is to get to **50-100 samples a day**.
- Besides **cancer survivors**, the test would help people with a family history of cancer or with a risk profile. The company is now discussing taking this technology to the United Kingdom and the US.

Topic 46. NATIONAL QUANTUM MISSION

Important for the subject: Science and technology

The Union Cabinet approved the **National Quantum Mission** with an allocation of **₹6,003.65 crore.**

- The mission puts India among the **top six leading nations** that have begun research and development in quantum technologies.
- The **six other nations** which are currently carrying out research and development in the segment include the **US, Canada, China, Austria, Finland and Scotland**.
- The **Union Cabinet** also approved the **Cinematograph (Amendment) Bill 2023** that include provisions to curb transmission of pirated film content on the internet.

About The National Quantum Mission:

- The mission **aims** to make India a leading nation in the quantum technology sector and promote economic growth.
- The total cost of the mission is over **six thousand crore rupees.** The mission will run from **2023-24 to 2030-31**.
- Union Minister for Science and Technology Dr. Jitendra Singh said that the **mission will give India a quantum jump in the world arena.**
- The **National Quantum Mission** will develop **four broad themes** — **Quantum Computing, Quantum Communication, Quantum Sensing and Metrology and**

Quantum Material and Devices.

Scope of the mission:

- The mission will look at development of **satellite-based secure communications between a ground station and a receiver located with 3,000 km** during the first three years.

- For **satellite-based communication within Indian cities**, the National Quantum Mission will lay communication lines using **Quantum Key Distribution** for over **2,000 km.**

- For long distances quantum communication, especially with other countries, tests will be conducted in the coming years.

- The mission will **focus on** developing quantum computers (qubit) with physical qubit capacities ranging between **50 and 1,000 qubits** developed over the next eight years.

- Computers up to **50 physical qubits** will be developed over **three years**, **50 – 100 physical qubits** in five years and computers **up to 1,000 physical qubits** in eight years.

Significance of the National Quantum Mission:

- The **National Quantum Mission** will have a **positive impact** on several industries, including communication, health, finance, energy, drug design, and space applications.

- The mission aligns with national priorities such as **Digital India, Make in India, Skill India, Stand-up India, Start-up India, Self-reliant India, and Sustainable Development Goals (SDG).**

- The mission seeks to promote scientific and industrial research and development in Quantum Technology.

- It aims to create a dynamic and innovative ecosystem in the field of quantum technology. The mission will facilitate the growth and expansion of quantum technology in India.

Quantum Technology

- **About:** Quantum Technology is based on the **principles of Quantum mechanics** that was developed in the **early 20th century** to describe nature at the scale of atoms and elementary particles.

- The **first phase** of this revolutionary technology has provided the foundations of understanding of the physical world and led to ubiquitous inventions such as lasers and semiconductor transistors.

- The **second revolution** is currently underway with the goal of putting properties of quantum mechanics in the realms of computing.

A Comparison between India and China:

- **R&D in China:** China started its research and development (R&D) in the field of quantum technology in **2008**.
- In **2022,** China boasts of developing the **world's first quantum satellite,** creating a **quantum communication line between Beijing and Shanghai,** and **owning two of the world's fastest quantum computers.**
- This was a result of **decade-long research** carried out in the hope of achieving critical breakthroughs.
- **India: Quantum Technology** remains a field highly concentrated in long-term R&D in India. Just a few hundred researchers, industry professionals, academicians, and entrepreneurs are in the field right now without a constant focus on R&D.
- **Quantum Tech and Private Sector:** Large Technology Corporations such as **Google, Microsoft, and IBM** have dedicated programmes for quantum computing and its applications.
- Similarly, several Indian startups such as **QNu Labs, BosonQ, and Qulabs.ai** are also doing remarkable work in developing quantum-based applications for cryptography, computing, and cybersecurity.

Topic 47. INDIAN SCIENTISTS FIND GENETIC MARKERS ASSOCIATED WITH PREMATURE BIRTHS

Important for the subject: Science and technology

What is the research about?

3/13For the **first time in South Asia**, Indian scientists working in the **Garbh-Iniprogramme**, **an interdisciplinary group for advanced research on birth outcomes**, have identified **19 single nucleotide polymorphisms (SNPs),** or **genetic markers**, that have been found to be associated with **preterm — or premature — birth.**

- For the study, the **Garbh-Ini team** undertook a **"genome-wide association study (GWAS)''** on spontaneous preterm birth on 6,211 women from Haryana.

- **Five** of these **SNPs** have been found to **"confer increased risk of early preterm birth (birth before 33 weeks)''** and can predict premature births.

- The study found that **four SNPs** found in the cohort were **"significantly associated trans-ethnic SNPs"**, which showed association both in **Indian women** as well as in the **women belonging to the European ancestral population.**

- One of the **SNP markers, rs35760881**, and **three more markers,** when compared with data on **European women,** was found to be also associated with **risk of preterm delivery.**

- These **SNPs** are known to **regulate important biological processes** such as inflammation, apoptosis, cervical ripening, telomere maintenance, selenocysteine biosynthesis, myometrial contraction, and innate immunity,

- The study also found that **spontaneous preterm birth (sPTB)**, the **major subtype of preterm birth (PTB),** occurs "either due to spontaneous early onset of labour or due to preterm prelabour rupture of membranes".

Significance of the study:

- **Preterm birth** is the **largest cause of neonatal deaths** and complications globally.

- Preterm births are defined as **births before 37 completed weeks of gestation.** Of all babies born annually in India, about **13% are born preterm,** accounting for **23.4% of preterm births globally**.

- When these babies become adults, they also become at higher risk of diseases such as **Type-2 diabetes, hypertension and cancer.**

- When we can predict, through these genetic markers, which women are likely to have preterm births, then these mothers can be monitored closely and triaged.

Garbh-Ini initiative:

- **Garbh-Ini**is an initiative under the **Department of Biotechnology (Ministry of Sci& Tech)** as a collaborative interdisciplinary programme, led by **DBT Translational Health Science and Technology Institute (THSTI), NCR Biotech cluster,**

- **Faridabad**, in collaboration with **DBT-NIBMG, Kalyani, DBT-Regional Centre for Biotechnology (RCB), Gurugram Civil Hospital and other organisations**.

- **Objective:** To **identify** c**linical, epidemiologic, genomic, epigenomic, proteomic, and**

microbial correlates; discover molecular-risk markers by using an integrative -omics approach; and generate a risk-prediction algorithm for **preterm birth.**

Topic 48. HOW AI CAN HELP THE ENVIRONMENT

Important for the subject: Science and Technology

AI has also been touted as a powerful tool to help tackle global crises, such as climate change.

- A study commissioned by tech giant **Microsoft** estimated that **AI applications** in the sectors of **agriculture, water, energy and transport** could lead to a **4% cut in greenhouse gas emissions** by **2030** — equivalent to the annual emissions of **Australia, Canada** and **Japan** combined. **six ways it's being put to use to help the environment:**

Saving trees with AI 'guardians'

- Planting acoustic monitoring sensors in forests to detect and track illegal logging and land clearing.

Shrinking the carbon footprint of steel

- In mining of raw materials for steel production, AI can be used to optimised and reduce the amount of mined ingredients-or alloys- by upto one third.

Cutting energy waste in buildings

- By collecting the data from commercial buildings and aanlysisng them via machine learning, the heating and cooling systems of commercial buildings can be optimized. These tweaks can save **10-30% of the energy used** in a typical commercial building.

Fighting poaching with algorithms

- AI based bracelets can be fitted to the animals to track their movement and illegal poaching of vulnerable animals.

Smart farming

- AI system can draw on data from solar-powered sensors monitoring the microclimate around crops.
- These insights can be used to make precise recommendations about plant health and

exactly how much water and fertilizer to use. This can both boost yields and reduce wasted resources.

Using computers to plot clouds

- The technology can be useful in the field of agriculture, solar energy generation among others.

Topic 49. A SPACEX ROCKET EXPLODED SOON AFTER LAUNCH, BUT WHY DID ELON MUSK AND HIS EMPLOYEES CELEBRATE?

Important for the subject: Science and Technology

After a flight test of its new reusable Starship rocket ended with the craft exploding into smoke and flames.

- The test was the first for the spacecraft manufacturer's Starship spacecraft (the carrier) and Super Heavy rocket (the booster), collectively referred to as **Starship.** The Starship represent a fully reusable transportation system designed to **carry both crew and cargo to Earth orbit, the Moon, Mars and beyond.**
- The **flight test failed** due to the **malfunction where the upper-stage Starship failed to separate from the lower-stage Super Heavy rocket**. The **celebration is due to the fact** that one of the major objective of getting the vehicle off the ground was achieved with a successful lift-off.

About SpaceX Starship:

- Starship is a fully reusable spacecraft designed and built by SpaceX with the primary goal of sending humans to the Moon, Mars, and beyond.

Key objectives

- **SpaceX** aims to use Starship to establish a **self-sustaining human settlement on Mars.**
- The ultimate goal is to enable humans to become a multi-planetary species. It also aims to make Starship reusable, reducing the cost of spaceflight and bringing down the price to a few million dollars per flight.
- In the long run, the company aims to achieve full and rapid reusability of the spacecraft.

Topic 50. PASSIVE FUNDS' AUM GROWS 34% IN FY23 NEARS ₹7 LAKH CRORE

Important for the subject: Economy

Passive investing refers to a strategy adopted by investors to optimize their returns by buying and holding a broad base of securities rather than churning portfolios by buying and selling them frequently.

- The main aim is not to beat the market but to track portfolio performances and provide returns equal to that of the prominent stock exchanges of the country. This is usually done by investing in a low-cost, broadly diversified index fund.

- Index funds, Exchange-Traded Funds (ETFs), and Direct Equity are the three types of passive investing. Due to its simplicity of having to buy and hold a broad-based index of securities, passive investing tends to gain prominence among the masses.

Khayal

- The word khayal, derived from Persian, means "imagination" Origin of this style was attributed to Amir Khusrau.

- Is popular amongst the artists as this provides greater scope for improvisation. Based on the repertoire of short songs ranging from two to eight lines. Is also referred to as a 'Bandish'.

- Khayal is also composed in a particular raga and tala and has a brief text.

- Texts mainly include Praise of kings, Description of seasons, Pranks of Lord Krishna, Divine love & Sorrow of separation

- **Major gharanas in khayal:** Gwalior, Kirana, Patiala, Agra, and BhendibazaarGharana Gwalior Gharana is the oldest and is also considered the mother of all other gharanas.

Historical evolution

- The early form of khayal emerged in the late 16th century when Sufi musicians based in the region between Delhi and Jaunpur adapted the *cutkula*form, which used a Hindi dialect, to devotional forms such as the Persian *qaul*and *tarana*sung in Sufi communities from Amir Khusro's (1253-1325) tradition, according to

- Katherine Butler Schofield, the foremost historian of khayal. Khusro, a musician, poet and scholar, lived during the rule of the Delhi Sultanate. The *cutkula*was a regional form that was in vogue during the reign of Sultan Hussain Shah Sharqi of Jaunpur, who ruled

from 1458 to 1505 and was a great music lover.

- The earliest version of khayal probably evolved into today's *drutbandish*, the fast composition, also called the chhotakhayal, which is meant to be sung in a spritely tempo, some experts say. The Sufi communities that were the crucible in which this emerged attracted both Hindus and Muslims, and its leading members had close relationships with Vaishnava sects, Butler Schofield says. In the early 17th century, khayal travelled from the Sufi communities to the qawwals of HazratNizamuddinDargah in Delhi, remaining within their lineage until the early 18th century, she further says.

- In the next phase, many experts agree that Niyamat Khan "Sadarang" (1670-1748), a famous dhrupad singer and been player at the court of the Mughal emperor Muhammad Shah "Rangila", who ruled from 1714 to 1748, played a key role in further developing khayal. In particular, he began creating khayal compositions with some melodic movements from dhrupad, setting many of these compositions in a slow tempo. This version became the vilambitbandish, or slow composition, also called the badakhayal, which is now the centrepiece of a raga rendition in khayal.

- Sadarang was a kalawant, the term used for a singer from a hereditary lineage of musicians attached to a Mughal court. Both his slow and fast compositions are widely sung to this day.

- Today, the majority of khayal's practitioners are Hindu, but in previous generations, a mix of Hindu and Muslim singers coexisted, while in its early phase, the genre emerged in a Sufi Islamic context.

Topic 51. PRIVATE EQUITY AND VENTURE CAPITAL FUNDS' INVESTMENTS DECLINE 4% TO $5.3 BILLION IN MARCH

Important for the subject: Economy

Venture capital and private equity are two **types of financial assistance that are used by companies** in different stages. **Private Equity is a large investment in developed companies** and **venture capital is a small investment usually made in initial stages of development of a company**. Private equity funds refer to **investments made by investors for investment purposes**.

Whereas, venture capital refers to **funding to those ventures that are backed by new**

entrepreneurs, have high risks, and who require money to shape their ideas.

Venture Capital

- Venture capital is referred to **funds invested by individuals or investors to startups** or small companies aspiring to establish a fresh concept and new entrepreneur.
- All those new private companies who cannot raise their funds from the public sector may raise funds from the venture capital. This type of investment indicates **high risk** but is supported by fresh and top qualified entrepreneurs. Venture Capital firms assist developing businesses in their initial stages before making it public.
- It is a popular funding process and sometimes required to raise money for bank loans, capital markets, or other debt instruments. This type of investor is known as a Venture Capitalist, and the capital they provide is called equity capital.

Private Equity

- Private equity can be defined as the **capital investment**, which is made by companies or investors in the private firms that are **not a part of the stock exchange**. These fund investments are **made by the high-net-worth firms or individuals**. These investors acquire private companies shares or earn authority of public companies to take them private and de-list from public stock exchanges.
- Private Equity firms purchase an existing company and help them to develop and expand.
- This entity has become an essential part of the financial services and is one of the attractive funding options.

Topic 52. MARCH WHOLESALE PRICE RISE SLOWS TO 1.34% ON BASE EFFECT

Important for the subject: Economy

Wholesale price index-based inflation fell to a 29-month low of 1.34 per cent in March due to moderation in prices of manufactured products, commodity prices and a favourable base effect, data released by the Ministry of Commerce and Industry on Monday showed.

Even though some food items showed an increase in inflation, this was the 10th straight month when wholesale inflation recorded a moderation. WPI inflation was recorded at 3.85 per cent in the previous month and 14.63 per cent in March 2022. For FY23, the wholesale

inflation averaged 9.4 per cent, moderating from a 30-year high of 13 per cent in FY22.

WPI

- It is the **most widely used inflation indicator** in India. It is published by the **Office of Economic Adviser, Ministry of Commerce and Industry.**
- All transactions at the first point of bulk sale in the domestic market are included. Major criticism for this index is that the general public does not buy products at wholesale price.
- The base year of All-India WPI has been revised from 2004-05 to **2011-12** in 2017.

WPI includes three components viz,

- Manufactured products – 64.2%
- Primary articles – 22.6%
- Fuel and power – 13.1%

CPI vs. WPI

- WPI, tracks inflation at the producer level and CPI captures changes in prices levels at the consumer level. WPI does not capture changes in the prices of services, which CPI does.

Disinflation

- Disinflation is a situation of decrease in the rate of inflation over successive time period. It is simply slowing of inflation. Central banks will fight disinflation by expanding its monetary policy and lowering interest rates.

Deflation

- Deflation is a decrease in general price levels throughout an economy. Deflation, which is the opposite of inflation, is mainly caused by shifts in supply and demand.

Imported Inflation

- When the general price level rises in a country because of the rise in prices of imported commodities, inflation is termed as imported.
- Two key contributors to India's imports are: Crude Oil and Gold. Rise in prices of these two products lead to rise in the import bill of the country. Fuel and power has 14.91% weightage in the Wholesale Price Index in India. However, inflation may also rise due to

the depreciation of the domestic currency, which pushes up the rupee cost of imported items.

Structural inflation

- Structural inflation is the one prevailing in most developing countries. The situation is due to the operation of the structural weakness (supply bottleneck, lack of infrastructure, etc.) existing in a developing economy.

- Lack of adequate supply responses or production to increase in demand is the cause of structural inflation.

- The Structuralist argues that the economies of developing countries like, Latin America and India are structurally underdeveloped as well as highly volatile due to the existence of weak institutions and imperfect working of markets.

- Such economies face the problem of both shortages of supply, under utilisation of resources as well as excessive demand in some sectors.

- Under developed transportation sector will increase logistic cost and will result in overall increase in prices of commodities

- Similarly, structural bottlenecks in agricultural sector such as APMCs, involvement of middlemen, imperfect price discovery leads to rise in food prices Resource constraints (such as government Budget constrain) to finance infrastructure development.

Topic 53. CENTRE FOR PROCESSING ACCELERATED CORPORATE EXIT (C-PACE)

Important for the subject: Economy

Centre for Processing Accelerated Corporate Exit (C-PACE), an **initiative of the Central Government** to accelerate the **process for voluntary winding up of companies,** will go live from May 1.

C-PACE:

- C-PACE or **Centre for Processing Accelerated Corporate Exit** is a newly **established body** that **aims to process and dispose of applications** for the removal of company names from the records under the **Companies Act, 2013.** C-PACE will be located at the **Indian Institute of Corporate Affairs (IICA) in Manesar, Haryana**, as a **one-stop**

solution for companies looking to close their business and remove their names from the Register of Companies.

- The **primary purpose of C-PACE** is to facilitate the **process of closing businesses and removing company names from the Register of Companies** from the **currently required 2 years to less than 6 months.**

- Companies **looking to file applications for the removal** of names from the Register of Companies under **Section 248 of the Companies Act, 2013**, can benefit from C-PACE.

- **The Registrar of C-PACE** has now been **designated as the Registrar of Companies (RoCs)** for the **purpose of exercising functional jurisdiction of processing and disposal of applications for voluntary winding up of companies.**

- The **Registrar of C-PACE** will have **territorial jurisdiction all over India** to consider processing and disposal of applications for removal of names of companies from the Register of Companies in case of voluntary winding up.

- MCA has also specified the format of **three new forms (STK-2, STK-6 and STK-7) related to voluntary winding up of companies.**

Topic 54. ESWATINI

Important for the subject : Geography

Five years ago, the King of Swaziland renamed his country "Eswatini".

About Eswatini

- Eswatini is **officially known as the Kingdom of Eswatini**, sometimes written in English as eSwatini, and formerly and still commonly known in English as Eswatini is a **landlocked country in Southern Africa**. It is **bordered by Mozambique to its northeast and South Africa to its north, west, and south.**

- The population is composed primarily of ethnic Swazis. The government is an absolute monarchy, ruled by King Mswati III since 1986. Elections are held every five years to determine the House of Assembly and the Senate majority.

Topic 55. EL NIÑO IS COMING AND OCEAN TEMPERATURE ARE ALREADY AT RECORD HIGHS

Important for the subject :Geography

El Niño tends to trigger intense and widespread periods of extreme ocean warming known as marine heat waves.

- By July, most forecast models agree that the climate system's biggest player – El Niño – will return for the first time in nearly four years.

- El Niño can also **wreak havoc on the many marine ecosystems** that support the world's fishing industries, including **coral reefs and seagrass meadows**.

- El Niño tends to **trigger intense and widespread periods of extreme ocean warming** known **as marine heat waves**. Marine heat waves also **unfold along the seafloor of coastal regions**.

- In the **Bay of Bengal** east of India, **interactions between El Niño and a tropical air flow pattern known as the Walker Circulation elevate the risk** for marine heat waves.

Marine Heatwaves:

- Heatwaves are **periods of extreme warmth** when **temperatures rise beyond the normal range** for at least two consecutive days or nights.

Formation of Marine Heatwaves:

- Marine heat waves form much **like land-based ones**: **weather systems intensify over time**, **leading to extremely high temperatures over large ocean surface areas**.

But there are key differences between them that drive their formation processes:

- **Land-based heat waves depend on atmospheric conditions** like highpressure systems (anticyclones) over land masses such as continents or oceans that block cold air from reaching those areas.

- **Marine heatwaves are periods when sea surface temperature reaches extreme levels for an extended period**, sometimes lasting weeks or months.

- These events occur in various ocean regions and can be caused by natural variability or human-induced climate change.

Causes of Marine Heatwaves:

- The main cause of marine heat waves is the increase in ocean temperature **due to the absorption of greenhouse gases** from the atmosphere, which leads to global warming.

- Natural climate variability can also contribute to marine heat waves, including **changes in ocean currents, weather patterns, and atmospheric circulation. El Niño-Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD**) can contribute to the occurrence of marine heat waves.

Impacts of Marine Heatwaves

- **Coral bleaching**: Marine heatwaves can **lead to coral bleaching**, which is the loss of **photosynthetic algae, called zooxanthellae**, from the coral. This can ultimately lead to the death of coral.

- **Ocean acidification:** Marine heatwaves can exacerbate ocean acidification, which is the **increase in acidity of seawater** due to the absorption of carbon dioxide from the atmosphere. This can have negative impacts on marine organisms that build shells or skeletons out of calcium carbonate, such as corals and some types of plankton.

- **Harmful algal blooms**: Marine heatwaves can cause harmful algal blooms, which can **produce toxins** that are harmful to humans and marine life.

- **Ocean circulation**: Marine heatwaves can also affect ocean circulationby**altering the temperature and density of ocean water**, which can have implications for ocean currents and the transport of nutrients and heat around the globe. **Marine biodiversity:** Marine heatwaves can **affect the composition and abundance of marine specie**s, leading to changes in marine biodiversity.

Topic 56. ASPIRATIONAL TOILETS

Important for the subject: schemes

According to the Union Ministry of Housing and Urban Affairs, a directive has been delivered to all State governments requiring them **to make sure that 25% of newly built public toilet seats in any city or urban unit would be "aspirational toilets".**

These will have high-end features such as luxurious bath cubicles, touchless flushing, breast-feeding rooms, and automatic sanitary napkin incinerators. These will be indicated as "**aspirational toilets" on Google Maps**. The focus areas to construct these luxury restrooms will be tourist and religious destinations, as well as iconic cities in places with a high footfall. The Ministry has decided to engage start-ups that can build such toilets across the country. To make these restrooms self-sustaining, the ministry is planning to attach them into other public services like restaurants, shopping centres, libraries, movie theatres, or drug stores.

About the scheme:

- The **aspirational toilets scheme** was launched in September 2022 as **part of the Swachh Bharat Mission (SBM) 2.0,** with an aim to help make cities open defecation free.
- The Centre has **allocated ₹1,41,600 crore to the SBM 2.0, which is 2.5 times more than the money allotted to the first phase of the mission in 2014.**
- The cost sharing pattern with States varies depending on the population of their cities.
- As of now, 6, 36, 826 public toilets have been constructed under the Swachh Bharat Mission-Urban, against a target of 5,587. 4,355 urban local bodies have been declared open defecation-free.

Topic 57. OLKILUOTO 3 NUCLEAR REACTOR (OL3)

Important for the subject : International Events

Finland's next-generation Olkiluoto 3 nuclear reactor, the largest in Europe, has gone into regular production.

About Olkiluoto 3 nuclear reactor (OL3):

- OL3 is an EPR (European Pressurized Water Reactor) located in Finland. It is built by the French-led Areva-Siemens consortium.

- It is the most powerful nuclear reactor in Europe, with a capacity of generating 1,600 megawatts.
- It covers approximately 14% of Finland's electricity demand.

Topic 58. SAURASHTRA-TAMIL SANGAM

Important for the subject: History

It is a **program** that **highlights the oneness of India's culture** by narrating untold histories of how a community **emigrated to Tamil Nadu** and their contributions to the country. The **Saurashtra Tamil Sangam** will be held at **Somnath, Dwarka** and **other places in Gujarat to connect Tamil Nadu and Saurashtra.** It will celebrate the civilisational links between people from the southern part of the country and the People from the Saurastra and Kedarnath in the north.

It is a **unique attempt where States shared their culture,** civilisation and heritage with each other, and the country united in soft power. The STS is the **second such programme** under the '**Ek Bharat, Shreshtha Bharat' initiative.** The first one was the **'Kashi Tamil Sangamam'**, a month-long event held last year to "rediscover" links between **Varanasi and Tamil Nadu**

More about Saurashtra Region:

- Saurashtra, also known as **Sorath or Kathiawar,** is a **peninsular region** of Gujarat, India, located on the **Arabian Sea coast.**
- It covers about a **third of Gujarat state**, notably **11 districts of Gujarat**, including Rajkot District.
- Saurashtra peninsula is bounded on the **south and south-west by the Arabian sea,** on the **north-west by the Gulf of Kutch** and on the **east by the Gulf of Khambhat.**
- From the apex of these two gulfs, the **Little Rann of Kutch and Khambhat, waste tracts half salt morass** half sandy desert, stretch inland towards each other and complete the isolation of Kathiawar, **except one narrow neck which connects it on the north-east with the mainland of Gujarat.**

59. INDIA TO HAVE MORE PEOPLE THAN CHINA BY MID-2023: UN

Important for the subject: International Organizations

India is probably the world's most populous country already. The latest estimates from the United Nations (UN) say India's population is expected to surpass that of mainland China by around 3 million people by the end of June 2023.

Key-highlights of the UN Report

- According to demographic data from the **United Nations Population Fund's** (UNFPA)-

Grouping the population

- 25 percent of India's population is estimated at below 14 years old 18 percent is estimated in the 10-19 year age group 26 percent in the 10-24 year bracket 68 percent in the 15-64 year age group 7 percent is estimated to be over 65 years old

- In contrast, 17% of China's population is estimated to be below 14 years of age, and 14 percent is estimated to be above 65 years old.

- The UN report estimates India's population will hit 1428.6 million my mid-2023, while China's (excluding Hong Kong and Macao, Special Administrative Regions of China, and Taiwan Province of China) is estimated to reach 1425.7 million.

- Asia's third-largest economy will soon house almost a fifth of humanity, more than the populations of Europe, Africa, or the Americas.

- **Distant third:** The United States is estimated to be a distant number three in the rankings, with nearly 340 million people.

- The report says eight countries will account for half the projected growth in global population by 2050: the Democratic Republic of the Congo (DRC), Egypt, Ethiopia, India, Nigeria, Pakistan, the Philippines and Tanzania.

What does the Indian government's data show?

- Data from the Indian government, meanwhile, says India's annual population growth has averaged 1.2 percent since 2011, compared with 1.7 percent in the 10 years previously.

United Nations Population Fund

- It is a **subsidiary organ of the UN General Assembly** and works as a **sexual and**

reproductive health agency. The **UN Economic and Social Council (ECOSOC) establishes its mandate**.

- It was established as a **trust fund in 1967 and began operations in 1969**. In 1987, it was officially renamed the United Nations Population Fund but the original abbreviation, 'UNFPA' for the United Nations Fund for Population Activities was retained.

- **UNFPA works directly to tackle Sustainable Development Goals on health (SDG3), education (SDG4) and gender equality (SDG5).**

- **UNFPA is not supported by the UN budget, instead**, it **is entirely supported by voluntary contributions** of donor governments, intergovernmental organizations, the private sector, foundations and individuals. The **State of World Population report is UNFPA's annual flagship publication**. HQ :**New York.**