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CURRENT AFFAIRS FOR CIVIL SERVICES

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Topic 1. 5G SERVICES TO BE ROLLED OUT IN INDIA

Important for subject: Science & technology

Prime Minister Narendra Modi will launch 5G service at the sixth edition Indian Mobile Congress (IMC-2022), which will be held in Pragati Maidan.

- Reliance Jio and Airtel were among the telecom giants that participated in the massive spectrum auction. They bid for a total value of Rs 1.56 crore.
- According to various reports, Jio and Airtel are the top-ranking companies in India for 5G service launch.
- Initial 5G launches will be limited to a handful of cities in the country. The 5G service will not be available to all users this year.
- To get 5G connectivity, you must have a smartphone or tablet that supports 5G.
- According to a report, 9.7% of Indian smartphones are 5G-capable.
- However, a 4G SIM will not work with 5G-powered phones.
- You can take advantage of 5G's full potential. A 5G SIM and a 5G smartphone are required in order to fully enjoy the 5G network.

About 5G Technology

- 5G is the latest update in the Long-Term Evolution mobile broadband networks. It has lower latency than 4G.
- 5G technology has a very low latency rate. The delay between the start and the end of the transmission is extremely minimal.
- Sending and receiving information.
- For 4G, it takes 200 milliseconds to get there. 5G is faster at 1 millisecond (or 1ms).
- It operates in three bandes of the spectrum, each with its own pros and cons.

Low Band Spectrum

- It is a promising product in terms of coverage and speed, with an internet speed limit of 100 Mbps (Megabits per Second).
- It can be used by telcos to install it for commercial users of cellphones who don't have high-speed internet needs.
- This may not be the best solution for the specific needs of an industry.

Mid-Band Spectrum

- Although it offers faster speeds than the low band, it has limited coverage and penetration of signals.
- It can be used by factories and other specialised units to build captive networks that can be tailored to the specific needs of an industry.

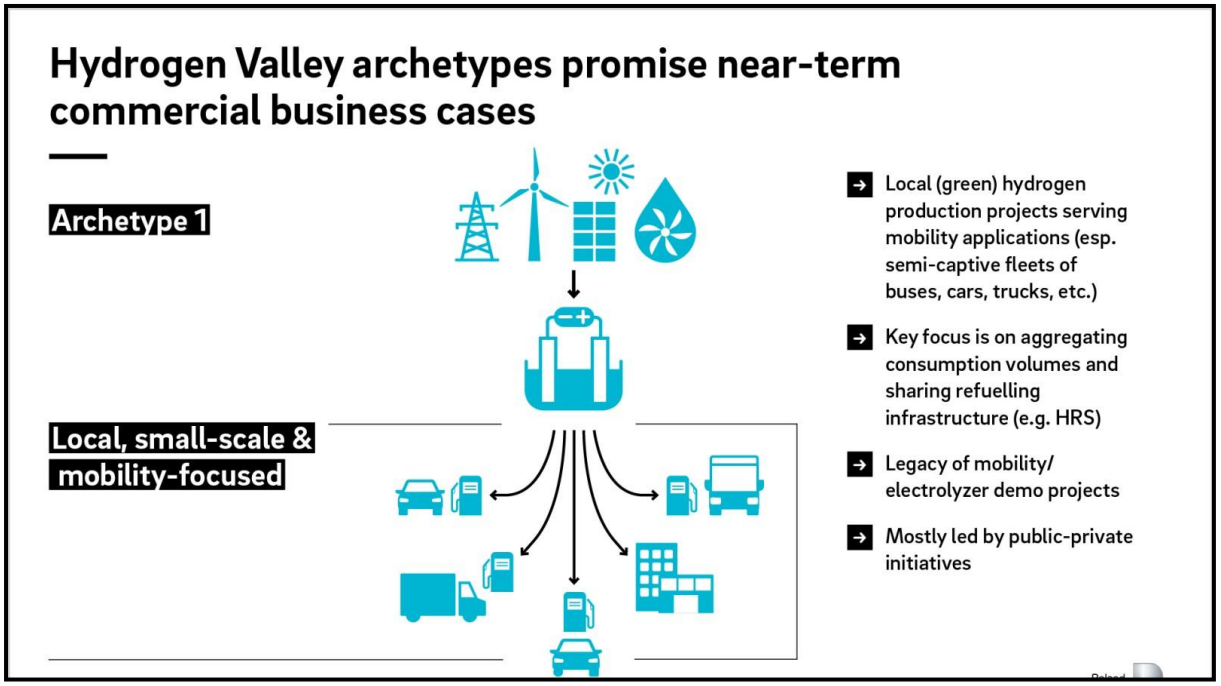
High-Band Spectrum

- This band offers the fastest speeds, but it has very limited coverage and signal penetration.
- Internet speeds of up to 20 Gbps (gigabits per sec) have been measured. 5G Global Status
- Global telecom companies are building 5G networks, and are rolling it out to customers on a trial basis.
- Already, 5G commercial connections have been provided by Telcos in advanced countries such as the US and China.
- Samsung, a South Korean company, began researching 5G technology back in 2011 and has been leading the development of hardware for many companies.
- Benefits
- It will allow the development, testing, and proliferation of 5G system components, as well as cross-sectoral uses cases.
- Users will be able stream video from multiple angles during sporting matches, or use VR headsets and other accessories to play immersive video games.
- It will also allow a network of IoT-enabled devices, services and devices with zero failure rate.
- This is similar to the case of connected cars.
- **Healthcare:** Healthcare providers have the ability to create sensor networks that track patients and share data faster than ever before.
- **Public Safety:** With a vast network and quick response times, public works can respond quickly to emergencies and incidents in seconds. Municipalities can also react quickly and at a lower cost.
- **5G: Autonomous Vehicles:** This will enable vehicles to communicate with each other and infrastructure on the road, increasing safety and alerting drivers about travel

conditions and performance information.

Topic 2. HYDROGEN VALLEY PLATFORM

Important for subject: Science & Technology



Hydrogen Valley Platform is an international initiative that optimizes hydrogen demand and supplies by onsite generation and use.

- It also aims to effectively utilise renewable resources in areas of water surplus with geographic identity.
- **The mission of the platform is:** To create a global platform for collaboration and information about large-scale hydrogen flagship projects (Hydrogen Valleys--H2Vs)
- The Hydrogen Valley Platform is an information sharing platform that supports the global fuel cell and hydrogen joint undertaking.
- Mission Innovation IC8 Member States.
- The H2 Valley's goals will be met through a network of clean hydrogen valleys that combine the entire hydrogen value chain (production storage transportation), with the goal of reaching critical scale and unlocking the learning curve effects.
- India has pledged to deliver three clean hydrogen valleys by 2030.

Topic 3. INDUSTRY RESEARCH & DEVELOPMENT FELLOWSHIP PROGRAMME (IRDFP)

Important for subject: Science and Technology

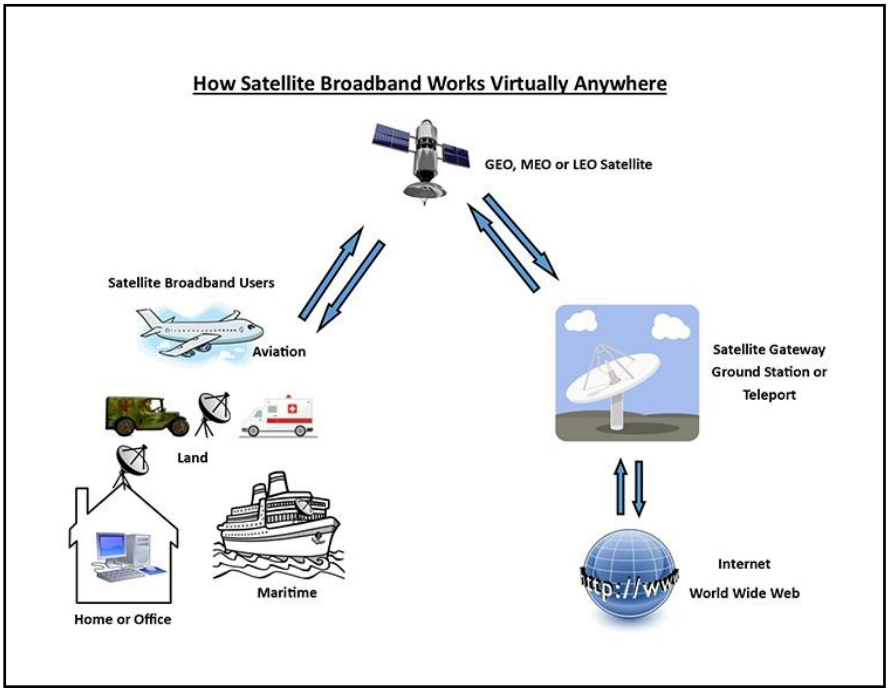
The India Research & Development Fellowship Programme (IRDFP), is jointly initiated and managed by the Department of Science & Technology, DST, and India

Energy Storage Alliance (IESA)

- The fellowship program will improve the skills of Fellows and be mutually beneficial to academic and industry partners.
- Researchers placed in industry will be able to gain a working understanding of business drivers and gain from industry contacts.
- Academic researchers can expect to be able to work in the industry through the up-skilling provided and the industry exposure. This will maximize the impact of their training.
- Faculty researchers can expect that their Fellowship will seed future industry collaborations and help shape their research direction.

Topic 4. SATELLITE BROADBAND SERVICES

Important for subject: Science & technology



As companies such as Jio, Oneweb and Hughes prepare to offer satellite broadband

connectivity, the race is on in India.

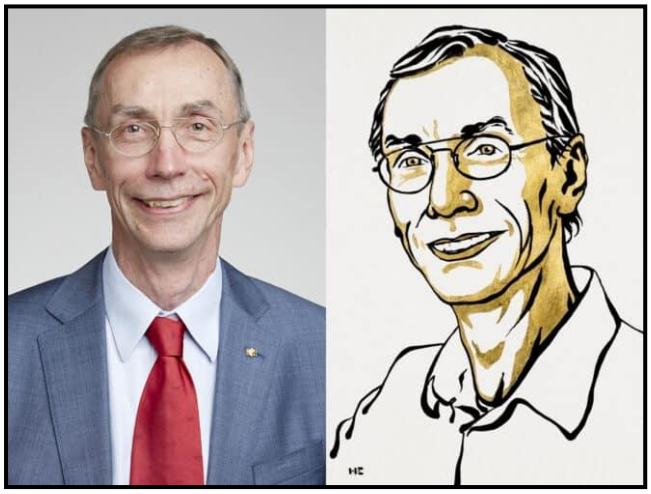
- Hughes Communications India (HCI), an Indian satellite internet service provider, launched India's first high-throughput satellite (HTS). It was powered by ISRO satellites.
- High-speed broadband was delivered using Ku-band capacity of ISRO GSAT-11 satellites and GSAT29 satellites, with Hughes Jupiter Platform ground technology.
- LEO (lower-earth orbit constellations), and HTS (high throughput satellites service) are the two most significant developments in global satellite communications space.
- LEO technology
- LEO satellites orbit the earth since the 1990s. They provide communication services to individuals and companies. LEO satellites orbit the earth around 500km-2000km. This is in contrast to stationary orbit satellites that are about 36,000km away.
- The time it takes for data to reach you and your location is what determines latency.
- LEO satellites orbit closer than the earth and can provide stronger signals and higher speeds than traditional fixed-satellite system.
- They can also rival, if not surpass, existing ground-based networks because they travel faster through space than fibre-optic cables.
- LEO satellites, however, travel at 27,000 kph to complete a full circle of the planet in 90-120 seconds.
- Satellites cannot make direct contact for long periods of time with land transmitters. This results in large LEO satellite fleets that require significant capital investments and massive satellite fleets.
- These costs make fibre, spectrum, and satellite the most expensive of all three internet media.
- LEO satellite broadband is therefore only recommended in areas that are not accessible by fibre or spectrum services.
- One Web's target market is therefore rural populations and military units operating out of urban areas.
- Satellites with high-throughput
- High-throughput satellite (HTS), which is satellite connectivity with higher bandwidth, increases data transfer between satellites and ground stations.
- Higher-throughput means that conventional satellites have higher data processing and

transfer capacities than those using the same orbital spectrum.

- Satellite connectivity is a traditional type of satellite connectivity that has low bandwidth and high latency. This refers to the time it takes for data to be transferred between sender and receiver.
- The HTS service will provide broadband connectivity in remote areas to help boost the local economy.
- This service supports applications such as Wi-Fi hotspots to provide community internet access, managed SDWAN solutions, backhaul for expanding mobile network reach, and small business satellite internet.
- What is satellite broadband and how does it differ from other broadband services?
- The difference is that the aggregation and transmission of all data generated by internet users is done in the sky, or in space that is in the satellite.
- Contrary to this, aggregation occurs on the ground, at the base stations, through optical fibre, cable, and other means.
- A key difference is the need for a dish antenna to access satellite services. This is just as we need in order to receive TV services. So a regular mobile phone cannot access satellite broadband directly.
- Satellite broadband access requires a clear line-of-sight to the satellite.

Topic 5. MEDICINE NOBEL GOES TO SVANTE PÄÄBO: WHAT HIS RESEARCH TELLS US ABOUT HUMAN EVOLUTION

Important for subject: Science & Technology



Svante Paabo, a Swedish scientist and academic, was awarded the Nobel Prize 2022 for Medicine "for his discoveries regarding the genomes extinct hominins as well as human

evolution."

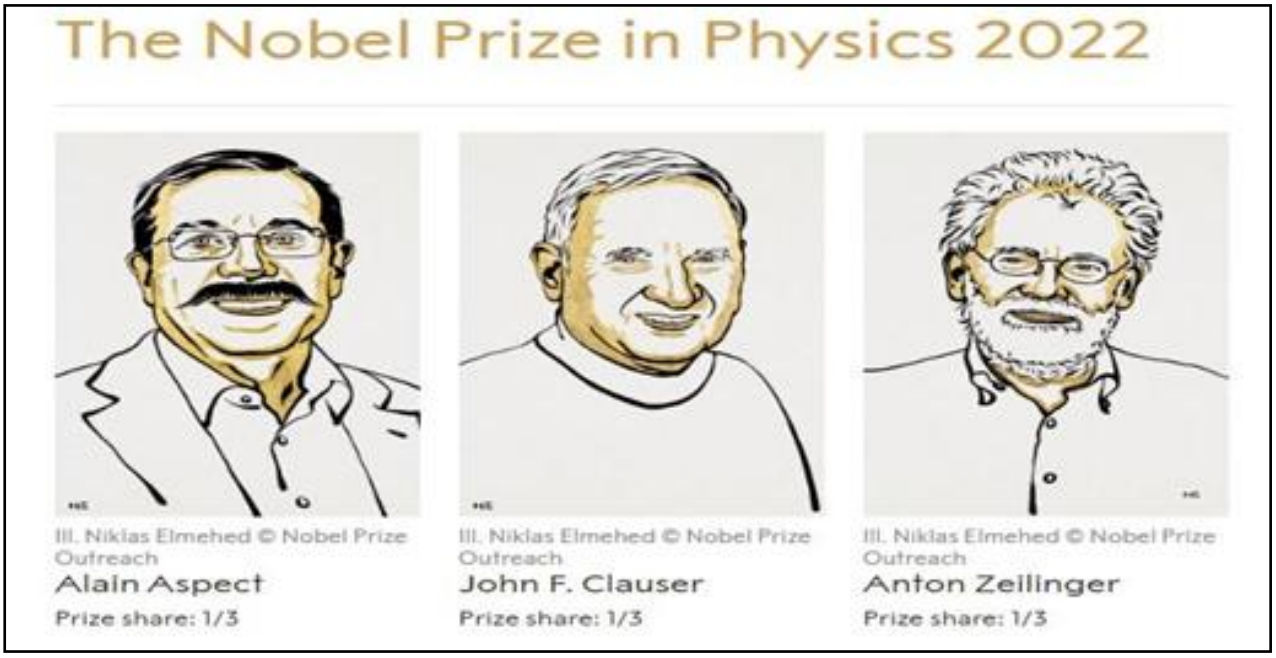
- Svante Paabo, a pioneer in his research, has sequenced the genome the Neanderthal, an extinct relative to present-day humankind.
- Denisova, a previously unknown hominin was also discovered by him.
- According to the Nobel Assembly, Svante Paabo's discoveries about evolution have "provided the basis for investigating what makes us unique human."
- His work is explained
- Hominins are the extinct species of apes believed to have been related to modern humans.
- Paabo also discovered that there had been gene transfer from the now extinct hominins back to Homo sapiens around 70,000 years ago, following the migration out Africa.
- The ancient flow of genes from the past to our modern-day species has physiological relevance.
- It can affect how our immune system responds to infections.
- Relation between evolution and biology-
- Svante Paabo created a new scientific discipline called paleogenomics.
- It focuses on the study of DNA and genetic information of extinct human beings through reconstruction.
- The physiology and behavior of modern-day people are influenced by archaic gene sequences inherited from extinct relatives.
- This linkage was demonstrated by Paabo's extraction of DNA from bone specimens taken from extinct hominins. These bones were found in the Denisova caves in Germany.
- His team sequenced the DNA from the bone, which contained exceptionally preserved DNA.
- This DNA sequence was unique compared to other sequences known from Neanderthals or present-day humans.
- Paabo had found a previously unknown hominin and gave it the name Denisova.
- Comparing sequences of contemporary humans from different parts the world revealed that gene flow or the mixing of genetic information between a species was also occurring between Denisova, Homo sapiens, the species of modern-day human

beings.

- This relationship was first observed in Melanesia (near Australia), and other parts South East Asia. Individuals can carry as much as 6% Denisova DNA.
- The Denisovan gene EPAS1 confers a survival advantage at high altitudes, and is common among Tibetans today.
- These researches can be challenging
- As time passes, DNA becomes chemically altered and breaks down into smaller fragments.
- The problem is that there are only small amounts of DNA left after thousands of generations. Exposure to the natural environment can lead to DNA contamination from bacteria, which makes research more difficult.
- It was remarkable that he sequenced a portion of mitochondrial DNA from the Denisovan bone piece, which dates back to 40,000 years ago. This marked the first time researchers have had access to an extinct sequence.

Topic 6. NOBEL PRIZE IN PHYSICS: BREAKTHROUGHS IN QUANTUM TECH

Important for subject: Science and Technology



Three scientists were honored by the Nobel Prize Committee: Alain Aspect from France, John Clauser from the USA, and Anton Zeilinger in Austria.

- Their experiments proved that quantum particles' 'entanglement phenomenon' was not

caused by any unknown or hidden forces.

- They also demonstrated that this phenomenon could be used to create transformative technological advances in computing and hack-free communications.

Background of Quantum theory-

- A few scientists noticed that the behavior of sub-atomic particles such as protons and electrons did not conform to the Newtonian laws.
- They developed the Quantum Theory over the next 30 year period, which describes the bizarre behavior of sub-atomic particles with incredible accuracy.
- Quantum Theory was completely opposed to everyday life.
- This allowed for a particle to exist at multiple locations simultaneously, a phenomenon called superposition.
- Probabilistic calculations determined the probability of finding the particle in any given location.
- Once it was observed or found at one location it ceases to exist in all other locations.
- These tiny particles also had other strange properties like entanglement.
- Two particles that had 'interacted' at one point with each other were found to be 'entangled' in such a manner that their behaviours produced instantaneous reactions in each other, even though they were not connected and separated by large distances.

Einstein's objection-

- This was especially true for Einstein.
- His Special Theory of Relativity forbid any signal to travel faster than the speed of light.
- Entanglement caused by instantaneous communication had the potential to further undermine the foundations and physics.
- Einstein suggested that there was still something missing and that Quantum Theory wasn't yet complete.

Bell's inequality-

- In the meantime, experimentalists discovered that nearly every prediction of Quantum Theory was being fulfilled by sub-atomic particles.
- This theory proved to be remarkably correct.

- Problem was, it wasn't possible to conduct an experiment to examine a phenomenon such as entanglement.
- John Bell, 1964, demonstrated mathematically what experimentalists needed to establish the phenomenon.
- If the experiment results are maintained, the famous Bell's inequality would indicate that Einstein was correct.
- It would be a violation of Quantum Theory's predictions.

Experiments by Clauser, Alain, and Zeilinger

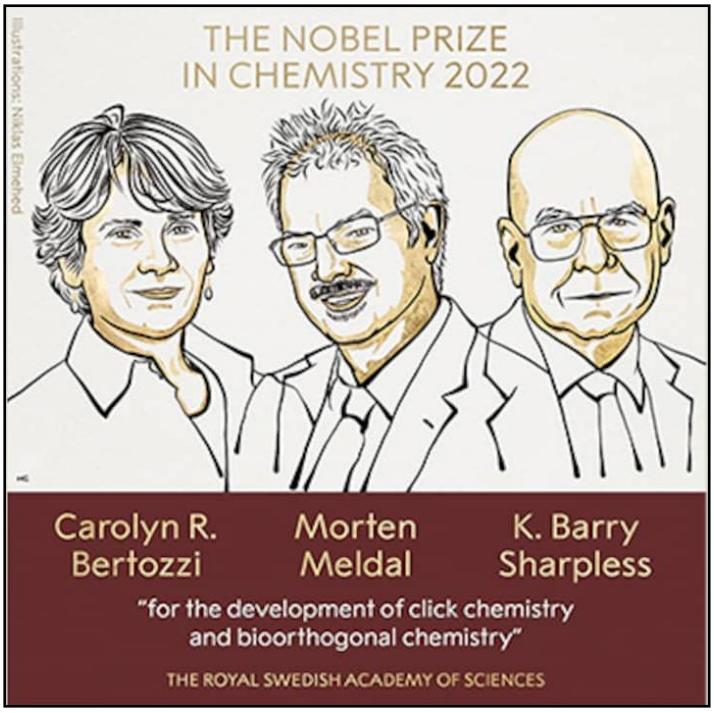
- Clauser, a 79-year old man, was the first to establish an experiment to test entanglement.
- His 1972 experiments were clearly in violation of Bell's inequality.
- Skeptics pointed out certain aspects of the experiment that could have contributed to a favorable result.
- Alain Aspect is widely credited with greatly improving Clauser's setup and eliminating all loopholes critics found. Bell's inequality was also violated by Aspect's experiments.
- Anton Zeilinger and his coworkers had in the meantime already begun to exploit the entanglement property to unlock new technological possibilities.
- Zeilinger proved for the first time that it was possible "teleport" the quantum states of a particle from one location to another without the particle moving.
- Clauser, Aspect, and Zeilinger proved that entanglement is real and consistent with Quantum Theory. They also demonstrated that it wasn't being driven by hidden forces, as Einstein suggested.

Application of quantum theory

- Now, the entanglement property can be used to build quantum computers.
- It is used to create secure communication protocols that are immune to hacking

Topic 7. NOBEL PRIZE 2022: MAKING CHEMISTRY CLICK

Important for subject: Science and Technology



Three scientists have been awarded the Nobel Prize in Chemistry 2022 in Chemistry. Their work has made it clear that they believe there is an alternative way to produce complex molecules in industry or in laboratory. This reduces waste and improves overall efficiency.

- Barry Sharpless from the United States, Carolyn Bertozzi of Denmark and Morten Meldal from Denmark were awarded the Prize for the development of the relatively new field of "Click Chemistry" and their demonstration of its immense potential in the pharmaceutical industry and other sectors.
- Sharpless is the inventor of the concept of "Click Chemistry" and has won the Nobel Prize for second time. He is now the fifth scientist to be awarded this distinction.
- His 2001 Nobel Prize was awarded in recognition of a completely different type of work.
- He stressed the importance of replicating nature's efficiency and not just its processes or products.

What is "Click" chemistry?

- Click is derived from the click sound airline seat belts make when fastened.
- It is important to find starting molecules that react well with each other when trying to

make a particular compound or complex molecule.

- Also, search for molecules that fit together or "click" with one another.
- This makes the chemical reaction more efficient.

Why is 'Click Chemistry' so appealing?

- For example, the pharmaceutical industry uses a lot naturally occurring, but synthetic molecules. Every kilogram of drug produces nearly 25-100kg of chemical waste. This is clearly not a good outcome.
- Sharpless wasn't just responsible for the development of ideas or the identification of the criteria that would allow a reaction to be referred to as a 'Click' reaction.

'Click' reactions-

- Barry Sharpless found the first chemical reaction that met his criteria for "Click" reactions.
- It was a modification of a chemical reaction that has been known for over 40 years.
- This reaction was intended to create a nitrogen-containing, cyclic compound which was used as a building block in a variety drugs.
- The normal process produced many by-products. Sharpless found that copper was a catalyst, which eliminated all by-products and produced the desired chemical.
- This discovery was made by Morten Meldal (a Danish scientist who independently worked on pharmaceutical substances), around the same period.
- Meldal's discovery of Meldal was accidental. However, once he realized the implications, he began to experiment with other molecules and had quite a few success stories.
- These initial successes generated lots of interest and many other 'Clicks' reactions were discovered by different researchers.
- A few years later, Carolyn Bertozzishow in 2004 announced that "Click" Chemistry could also work in chemical processes occurring in living cells. This was the next major breakthrough in this field.
- She developed a few click reactions that worked inside living organisms.
- Bertozzi's methods have been repeatedly improved over the years and show promise in treating advanced cancer.

- Clinical trials are underway for cancer drugs that were developed using her method.

Topic 8. POKKALI, A GI-TAGGED RICE VARIETY, COULD BE ON THE VERGE OF EXTINCTION

Important for subject: Science and Technology

Pokkali rice, a saline-tolerant indigenous rice variety, is grown in the Alappuzha and Thrissur districts of Kerala.

- Pokkam means height in Malayalam. Aalimeans This less-known variety of rice is grown in low-lying coastal regions and uses one of the oldest organic farming methods.
- Because of its uniqueness, the rice was awarded the Geographical Indication (GI).
- Pokkali refers to a system where rice and prawn are alternately cultivated (the fields are alternately used for rice farming, prawn cultivation and shrimp cultivation).
- In West Bengal, this agriculture-fisheries integration is known as bheries, in Karnataka it is called gajani, in Goa and Maharashtra it is called khazaan and in Kerala it's pokkali.

What makes Pokkali so special?

- Pokkali can be grown without any fertilizers, organic or chemical, because it is grown in waterlogged regions.
- Pokkali can claim organic because it is grown in water. Even if pesticides were used, seawater levels change will wash away pesticides.
- Organically grown rice with high levels of protein and fibre is renowned for its unique taste and medicinal properties.
- Pokkali received a Geographic Indication (GI) tag because of its geographic specificity in 2008.
- According to Pokkali Land Development Agency (PLDA), Pokkali farming in Kerala has dropped from 25,000 to about 4,000 ha.
- However, actual agriculture is done on less than 1,000 hectares. According to them, this has also had an impact on prawn farming.

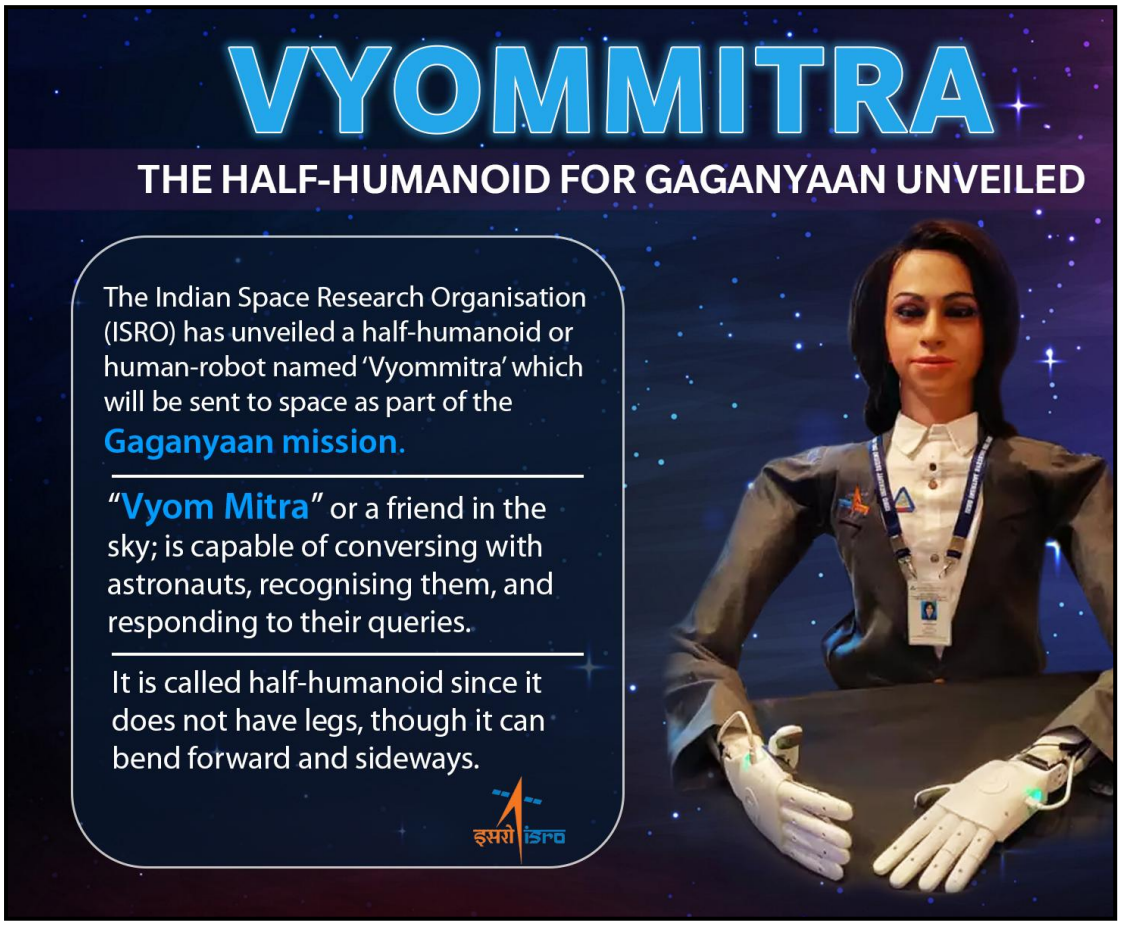
The reasons for decline:

- The highly productive but fragile coastal wetlands are rapidly deteriorating because of

several factors, including habitat destruction, unsustainable resource exploitation and intensive aquaculture.

Topic 9. ISRO'S HUMANOID VYOM MITRA'S SKILLS TO GET A LIFT-OFF

Important for subject: Science & technology



Vyommitra is a humanoid that was developed by ISRO. It has been successfully integrated to a computer brain which allows it to read control panels onboard and communicate with ground stations.

About Vyom Mitra:

- The ISRO Inertial Systems Unit in Thiruvananthapuram has developed the humanoid.
- Vyom Mitra, a half-humanoid, is completely void of legs and stops at her torso.
- The humanoid will mimic the human functions needed for space flight before real astronauts can take off.
- Vyommitra has been created to look like a human, with facial expressions, speech, and sight. The computer simulations will test the control systems for microgravity.

Capabilities:

- The humanoid can sense changes in the environment and alert the user.
- She can switch panel operations, perform Environment Control and Life Support Systems functions (ECLSS), have conversations with astronauts, recognize them and solve their questions.
- The AI-enabled robot is able to withstand vibrations during flight.

Role of Vyom Mirtra:

- Vyommitra will be flying aboard the first unmanned test flight before the crewed Gaganyaan flight, which is expected to take place in 2024.
- It will replicate the exact human functions in space.
- It will verify that the systems work properly.

Gaganyan Mission:

- Gaganyaan was a mission of the Indian Space Research Organization.

The Gaganyaan schedule is:

- Three flights will be launched into orbit.
- Two unmanned and one human spaceflights will be conducted.
- Three Indian astronauts will be able to fly aboard the Gaganyaan module called the Orbital Module.
- It will orbit Earth in a low-earth orbit at 300-400 km above the surface for five to seven days.

Payloads:

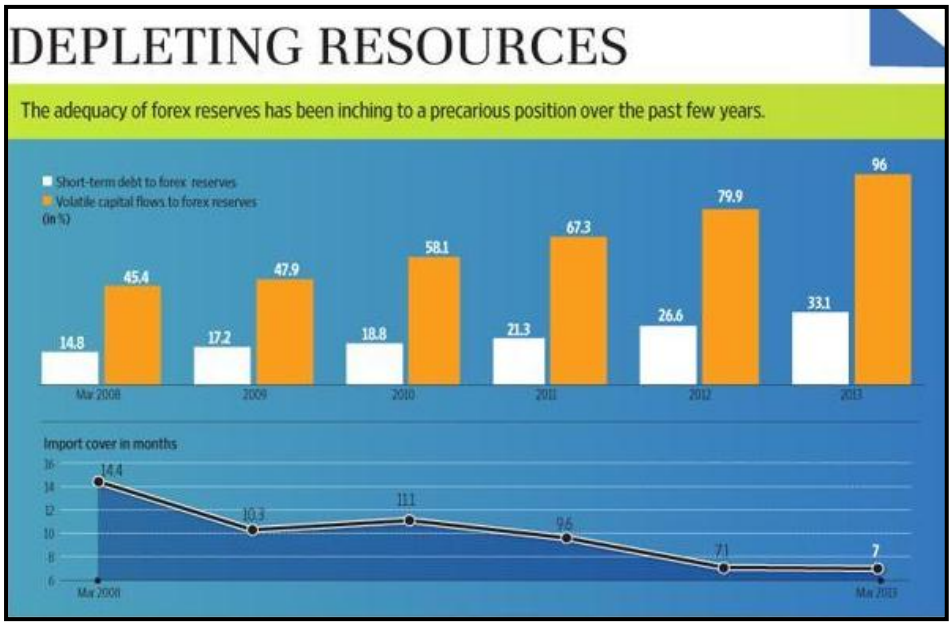
- Crew module-spacecraft for carrying humans.
- Two liquid propellant engines power the service module.
- It will have emergency escape and mission abort capabilities.
- The three-stage heavy lifting launch vehicle GSLV Mk III (also known as the LVM-3 (Launch Vehicle Mark-3), is used to launch Gaganyaan because it has the required payload capability.

Russian Training:

- The Human Space Flight Centre of Russia's ISRO and Glavkosmos, Russian government-owned Glavkosmos, signed a contract in June 2019 for training. This includes Russian support in the selection and medical examination of candidates and their space training.
- Candidates will learn in depth the systems of Soyuz's manned spaceship and be trained in short-term weightlessness mode aboard an Il-76MDK aircraft.
- Russian spacecraft, the Soyuz. The Soyuz is used to transport supplies and people to and from space station.
- The Il-76MDKis an aircraft of military transport specially built for parabolic flights by astronaut trainees and tourists to space.

Topic 10. THE DEPLETING IMPORT COVER

Important for subject: Economy



The total foreign currency reserves have been steadily falling from $642 billion at the peak in September 2021 to $546 trillion by September 2022. This is the lowest level in nearly two years.

- In reality, the decline in reserves has averaged $5 billion over the past three weeks.
- This has reduced the foreign currency reserves' import coverage from 17.4 months at the end of March 2021 to 13.1 in December 2021.
- The RBI has just released estimates that show that the reserve's import coverage will be reduced to nine months in September 2022.

- The sharp decline in foreign exchange reserve import coverage is a concern because it can increase vulnerabilities in the external sector.
- This is especially true since the United States Federal Reserve has pushed for the third consecutive increase in interest rates and is currently pursuing the fastest tightening of monetary policies since the 1980s.
- India's import coverage has fallen to levels that were seen during the global financial crisis, when it was at its lowest level for 4 to 10 months.

What is import cover?

- The import cover is the amount of imports that can covered by foreign currency reserves at the central bank.
- For currency stability, it is important to have import coverage for ten months.
- **Foreign reserve fall:** Causes
- The exchange rates of the reserve currency basket are affected by changes in exchange rates. Intervention of RBI in foreign exchange markets.

What are the options?

- There was a substantial drop in current and trade deficits, and an increase in surplus in the capital account.

Government efforts

- Foreign investors are now allowed to buy short-term corporate debt as well as invest in government securities.
- It also increased NRI bank deposit rates and annual limits for external commercial borrowing from the corporate sector.
- It will also reduce the demand for dollars by allowing foreign trade to be settled in rupees.

Extra concepts:

- **Baltic Exchange -**
- The Baltic Exchange Limited, also known as The Baltic Exchange Limited, is a membership association for the maritime industry and a freight market information provider for settlement and trading of physical and derivative contracts.

- It was originally located at 24-28 St Mary Axe in London. In 1992, a bomb destroyed the building. Now it is located at 38 St Mary Axe.
- Further offices are located in Europe, Asia and the United States.
- BIFFEX (the Baltic International Freight Futures Exchange) was a London-based platform for ocean freight futures trading. Settlements were based on the Baltic Freight Index.

Baltic Freight Index

- Baltic Freight Index is a shipping and trade index that was created by the Baltic Exchange, based in London.
- It's a measure of how much it costs to transport various raw materials.
- Baltic Exchange contacts shipping brokers directly to assess the price level for a particular route, product, time, and speed.

Topic 11. THE DEPLETING IMPORT COVER

Important for subject: Economy

The total foreign currency reserves have been steadily falling from $642 billion at the peak in September 2021 to $546 trillion by September 2022. This is the lowest level in nearly two years.

- In reality, the decline in reserves has averaged $5 billion over the past three weeks.
- This has reduced the import coverage of foreign exchange reserves, which was at its highest point of 17.4 months at the end of March 2021 and fell to 13.1 months at the end of December 2021.
- The RBI has just released estimates that show that the reserve's import coverage will be reduced to nine months in September 2022.
- The sharp decline in foreign exchange reserve import coverage is a concern because it can increase vulnerabilities in the external sector.
- This is especially true since the United States Federal Reserve has pushed for the third consecutive increase in interest rates and is currently pursuing the fastest tightening of monetary policies since the 1980s.
- The import cover of India's foreign currency reserves has fallen to levels that were seen during the global financial crisis, when it was 4 to 10.3 month.
- What is import cover?

- The import cover is the amount of months that can be covered by foreign currency reserves at the central bank.
- For currency stability, it is important to have import coverage for ten months.

Foreign reserve fall: Causes

- The exchange rates of the reserve currency basket are affected by changes in exchange rates. Intervention of RBI in foreign exchange markets.

What are the options?

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- It will also reduce the demand for dollars by allowing foreign trade to be settled in rupees.

Baltic Exchange -

- The Baltic Exchange Limited, also known as The Baltic Exchange Limited, is a membership organization for the maritime industry and a freight market information provider for settlement and trading of physical and derivative contracts.
- It was originally located at 24-28 St Mary Axe in London. In 1992, a bomb destroyed the building. Now it is located at 38 St Mary Axe.
- Further offices are located in Europe, Asia and the United States.
- BIFFEX (the Baltic International Freight Futures Exchange) was a London-based platform for ocean freight futures trading. Settlements were based on the Baltic Freight Index.

Baltic Freight Index

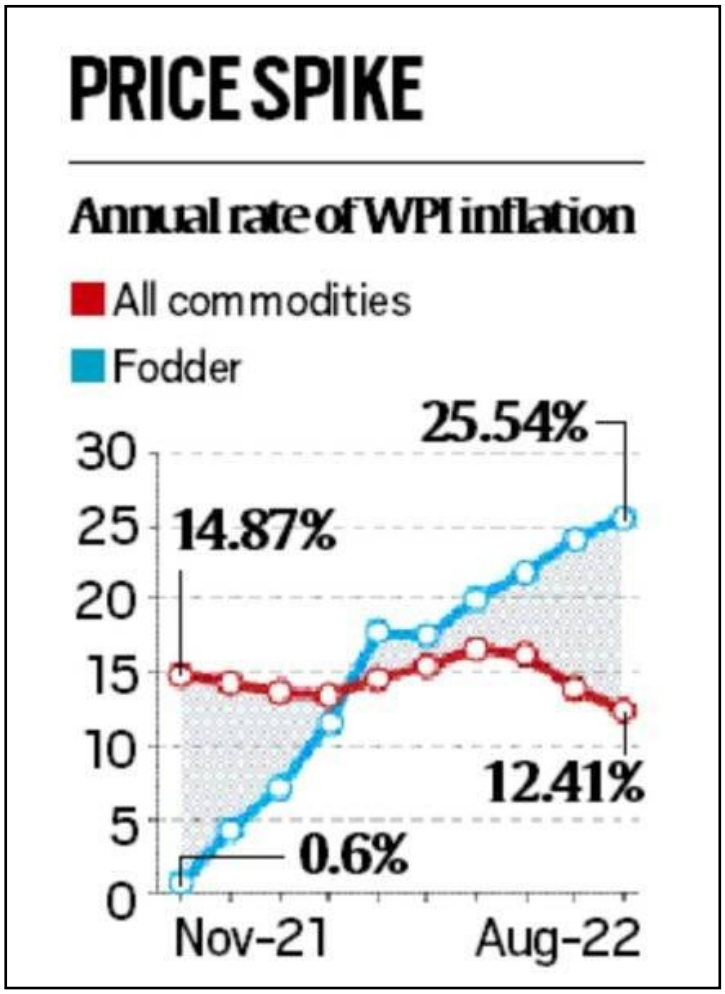
- Baltic Freight Index is a shipping and trade index that was created by the Baltic

Exchange, based in London.

- It's a measure of how much it costs to transport various raw materials.
- Baltic Exchange contacts shipping brokers directly to assess the price level for a particular route, product, time, and speed.

Topic 12. FODDER INFLATION

Important for subject: Economy



Fodder inflation at 9-yr high, late rains, crop damage deepen crisis

- The Wholesale Price Index (WPI-based fodder inflation) - 25.54 percent in August 2022. This is the highest level in the past nine years.
- Since December 2021, the fodder inflation has been increasing.
- August 2022 saw the lowest overall WPI inflation at 12.41 percent.
- September 2021

Cause:

- The shortage of green fodder, dry fodder -paddy or wheat straw is not completely converted into high quality fodder. It is rather burned.
- Combination harvesters leave large portions of the stalks on the fields and require a second round for fodder.
- Crop damage is caused by heavy and late monsoon rain.
- Changes in cropping patterns: Farmers are moving away from cereal crops that produce fodder.
- Reduced grazing areas due to conversion of land into protected zones and the growth of invasive species.
- In India, breed and crossbreed cows were introduced in the 1970s. They produce more milk but are more expensive to eat.
- According to the National Statistical Office report titled "Situation Assessment of Agricultural Lands" (Statuation Assessment of Agricultural Lands), high fodder inflation has a direct effect on rural livelihoods.
- Households and Land and Livestock Holdings of Households of Rural India, 2019, 43.8 percent of total 9.3 million agricultural households use green fodder. 52.4 percent of these households use dry fodder. 30.4 percent concentrates and 12.5 Percent other animal feed between July and December 2018.

Types of Common Inflation:

- Currency inflation is caused by currency notes being printed.
- **Credit inflation:** When credit expansion causes an increase in the price level.
- **Deficit-induced Inflation:** This is when the expenditure exceeds the revenue. The government can request the RBI to print money to cover the deficit.
- **Demand-Pull Inflation:** This is when there is an increase in aggregate demand that exceeds the available production.
- Cost-push inflation is a result of an overall rise in production costs.

Topic 13. BANK DEPOSITS

Important for subject: Economy

The flow of household financial assets saw a decrease with bank deposits recording a fall in growth while their holdings of mutual funds, equity, and small savings showed significant increases during fiscal 2021-22.

- As interest rates fell to decadal lows during the covid period, bank deposits saw a 48% decline.
- From 16 percent in the previous year, 10.8 percent of households' total financial assets fell to 10.8 per cent.
- Components in which financial assets of households rose
- Direct investment by households in stock markets
- Mutual funds via systematic investment plans (SIPs).
- Small savings can be invested

Causes:

- The repo rate regime has been reduced post-Covid
- Small & Marginal Enterprises that closed during the pandemic were not available to households. A high inflation rate of 7 percent makes real deposit rates negative.

Bank deposit:

- It is money that has been placed in banks institutions to be safe. These deposits go to bank accounts like savings, current, and money market accounts.
- As per the terms and conditions of the account agreement, the account holder can withdraw any deposited funds.
- There are basically two types of deposits: There are two types of deposits:

- Demand Deposits and Time Deposits.
- It is known as demand deposit if the funds can be withdrawn at any time by the customer (depositor/account holder) without prior notice to banks.
- Money deposited with "tenure" cannot be withdrawn until it reaches a specific time. These deposits are known as "Time deposits" and "Term deposits".
- There are four types of bank deposits in India

Current Account:

- A current account, a special type account, has lower restrictions when it comes to transactions and withdrawals than a savings account.
- It's also known as a demand account, and is intended for businessmen who want to smoothly conduct business transactions.
- These overdraft options are also offered by banks. They allow account holders to withdraw more money than is available in their account.

Savings accounts:

- It is highly popular and has high liquidity. However, it does not allow cash withdrawals or transaction limits, which can be used to encourage digital payments.
- The interest rate offered by banks is slightly lower than inflation so it is not the best for investment.
- Recurring deposits
- This is a unique type of term deposit that does not require you to save a large sum, but rather you must deposit a set amount each month.
- You cannot withdraw funds from the account prior to maturity. However, you can close it for a penalty.

Fixed Deposits:

- This investment avenue is offered by banks, financial institutions and non banking financial companies (NBFCs), which guarantees returns.
- This account offers higher interest than regular savings accounts and a range of tenures, from 7 days up to 10 years.

Topic 14. INTEREST RATES LIKELY TO GO UP

Important for subject: Economics

The Repo Rate has been increased by RBI 50 basis points to 5.90%.

- In the last monetary policy review, the RBI increased the Repo Rate by 50 basis points from 5.90 to 5.90.
- The Monetary Policy Committee (MPC), seeks to keep inflation within the target range while encouraging growth.
- High-interest rates are expected to continue for at least two to three more years.
- When inflation falls, the central bank reduces the Repo Rate.
- The central bank maintained its CPI inflation projection of 6.7% for FY23 but downgraded real GDP growth projections for FY23 from 7.2% and FY24 to 6.5%.
- CPI will likely remain at 6 percent for the first three quarters of FY23.
- This means that EMIs and tenures on loans may rise even further.

Economic Impact

- **Impact on the economy:** These hikes will raise lending rates and have an impact on the economy's demand.
- Inflation is reduced when interest rates rise.

High EMI's

- Costlier personal, vehicle, and home loans are also coming.

Repo Rate

- It's the rate at which a central bank of a country (Reserve Bank of India, in India) lends money out to commercial banks in the case of any shortage of funds.
- Repo is short for "repurchase option" or "repurchase agreement".
- These short-term loans are provided by the central bank against securities like government bonds or treasury bills.
- It is also known as Policy Rate.
- Monetary authorities use the repo rate to manage inflation.
- When they have to reduce borrowings and control prices, the government will increase the repo rate.

- The repo rate can be decreased when more money is needed to support economic growth.

Topic 15. CENTRAL BANK INTERVENTION

Important for subject: Economy

Global foreign-currency reserves are declining at an unprecedented rate as central banks from India and the Czech Republic intervene in support of depreciating currencies.

- **Valuation changes-** As the dollar rose to two-decade-highs against other reserve currencies like the euro or yen, it decreased the dollar value of its holdings.
- Central Bank Intervention-central banks around the globe intervene to support depreciating currencies.

Intervention by the Central Bank

- This is sometimes called currency manipulation or foreign exchange market intervention.
- It involves a central banking institution playing an active and participative role in influencing the rate at which monetary funds are transferred to the national currency.
- Usually, it does this with its own reserves or authority to create the currency.
- Central bank intervention is when a central banking institution buys or sells its currency on the foreign exchange market to increase (or decrease) its value in relation to another currency.
- Intervention is usually required when a country's currency is under excessive downward or upward pressure from the market players, often speculators.

TYPES:

- **Verbal Intervention -** When officials from the central banks "talk up" or "talk down" a currency.
- This can be done either by threatening to buy/sell currency or simply by indicating that it is undervalued/overvalued.
- Because it doesn't require the use of foreign currency reserves, this is the simplest and most cost-effective form of intervention.
- **Operational intervention-**This refers to the actual buying and selling of currency by a central bank in a country.

- **Concerted intervention**-This is when multiple countries coordinate to drive up or down a currency using their foreign currency reserves.
- **Sterilized Intervention** - When a central bank sterilizes their interventions, it compensates them through open market operations.
- Sterilization can occur when the central bank sells short-term securities to drain excess funds from circulation.
- Sterilized intervention, by definition, has no or little effect on domestic interest rates since the money supply is constant.
- Non-sterilization intervention-influences the exchange rate by inducing changes in the stock of the monetary base, which, in turn, induces changes in broader monetary aggregates, interest rates, market expectations and ultimately the exchange rate

Topic 16. PARIS CLUB

Important for subject: Economy

The Paris Club approached India and China to ask for their cooperation in restructuring Sri Lanka's foreign loans.

- Sri Lanka's largest creditors are India, China, and Japan. They account for approximately $10 billion of Sri Lanka's almost $51 billion foreign borrowings.
- None of the governments have yet to agree to restructuring their debts to assist Colombo in meeting the terms of IMF's deal.
- Sri Lanka was not included in the G-20 "Common Framework" adopted in 2020.
- This framework allows low-income countries, including India and China, to restructure their loans to the G-20 governments.

What is the 'Paris Club?

- This informal group of representatives from major creditor nations whose job it is to find sustainable and coordinated solutions to payment problems faced by debtor countries is called the "Cooperation Group".
- Paris Club creditors offer debt treatment to debtor countries in form of rescheduling.
- This is debt relief by postponement, or in the case concessional rescheduling reduction in debt service obligations over a specified period (flow treatment), or as a fixed date (stock treatment).
- Since 1956, the Paris Club has been gradually created.
- This was when Argentina's first negotiation with its creditors public took place in Paris.
- The Paris Club deals with public claims, that is to say those owed by governments of debtor nations and the private sector.
- It is very similar to the London Club, which was formed in 1976 by a group commercial bankers to help Zaire with its financial problems.
- The London club focuses on providing debt relief for countries facing financial difficulties due to heavsy debt loads.
- 22 permanent members are currently a part of the Paris Club.
- Japan, unlike India and China, is a member the Paris Club.

Topic 17. INTERNATIONAL SEED TREATY

Important for subject: Environment

Theme: Celebrating Guardians of Crop Diversity: Towards an inclusive Global Biodiversity Framework

- India hosted the 9th session (GB-9) at the International Treaty on Plant Genetic Resources for Food and Agriculture.

Information about ITPGRFA

- It is an important international agreement that aims to conserve, use, and manage plant genetic resources for food or agriculture (PGRFA). Background: It was signed in Madrid in 2001 and became effective on June 29, 2004,
- Total members: 148 (147 countries, 1 inter-governmental organization- EU).

Significance:

- Food security is guaranteed through the exchange, conservation and sustainable use worldwide's PGRFA.
- Fair and equitable sharing of the benefits resulting from PGRFA Recognition.
- The Treaty allows farmers and plant breeders to easily access the genetic material necessary to create new varieties of crop varieties that are more resilient to climate change.
- It is compatible with the Convention on Biological Diversity.
- The following are key terms that are associated with the Treaty
- Digital Sequence Information (DSI).
- Refer to data that are derived from genetic resources, such as nucleic acids sequence data or protein sequence data.
- DSI is an important concept within international legally binding instruments that provide access and benefit-sharing obligations, such as CBD, Antarctic Treaty System, Pandemic Influenza Preparedness Framework, etc.
- Multilateral System for Access and Benefit-sharing Mechanism (MLS) Upon joining the International Treaty, all countries agree to make their genetic variety and other information about crops in their public gene bank available to everyone through the Multilateral System.
- This allows scientists, farmers, breeders, and the private sector to collaborate with the material stored in gene banks and used in breeding programs without the need to sign contracts.
- It contains 64 of the most important crops in the world. These crops together account for over 80 percent of all plant-derived human food.

Topic 18. UNEP CALLS NORD STREAM METHANE LEAK 'BIGGEST-EVER'; PLUME OVER EUROPE FADING

Important for subject: Environment

According to the United Nations Environment Programme, the largest such greenhouse gas release is that from the Nord Stream natural gas pipeline, which runs from Russia to Germany, on September 26th 2022.

- The methane plume that hovers over Europe is however rapidly disappearing.

- The Nord Stream pipeline has been found to have three confirmed gas leaks and one potential gas leak.
- The plume is expanding, and the greenhouse gas has already been detected in Finland (Sweden), Norway, and the United Kingdom.
- Both the Nordstream 1 as well as Nordstream 2 pipelines had leaks.
- After the leak, the former was temporarily shut down. The latter was suspended by Germany after the Russian invasion.
- One rupture point's leak rate was 22,920 kilograms an hour. This represents the 285,763 kilograms of coal that is burned every hour.
- The radius of the methane plume measured 700 metres on September 26.
- Now, it is approximately 290 meters.

Nord Stream Gas pipeline-

- Nord Stream consists two pipelines that each have two lines.
- Nord Stream 1 was finished in 2011.
- It runs from Vyborg, Leningrad (Russia), to Lubmin near Greifswald in Germany.
- Nord Stream 2, which runs from Ust-Luga, Leningrad to Lubmin, was completed in September 2021. Once it is operational, it will be able to handle 55 billion cubic metres of gas annually.
- Together, the twin pipelines can transport 110 billion cubic meters (bcm), of gas per year to Europe for at most 50 years.
- The Nord Stream crosses several countries, including Russia, Finland and Sweden. It also crosses the Exclusive Economic Zones of Germany (EEZs).
- The pipeline connects to Germany's OPAL (Baltic Sea Pipeline), and NEL (North European Pipeline), which connects to Europe.
- Methane as GHG- Methane accounts for over a quarter the global warming.
- Within 20 years, the greenhouse gas will be 80 times more dangerous than carbon dioxide.
- UNEP revealed earlier this year that methane is leaking from oil and gas fields all over the world, including those in America and Turkmenistan.
- The release can also be traced back to equipment failures and can last up to weeks.
- Other sources of methane emissions

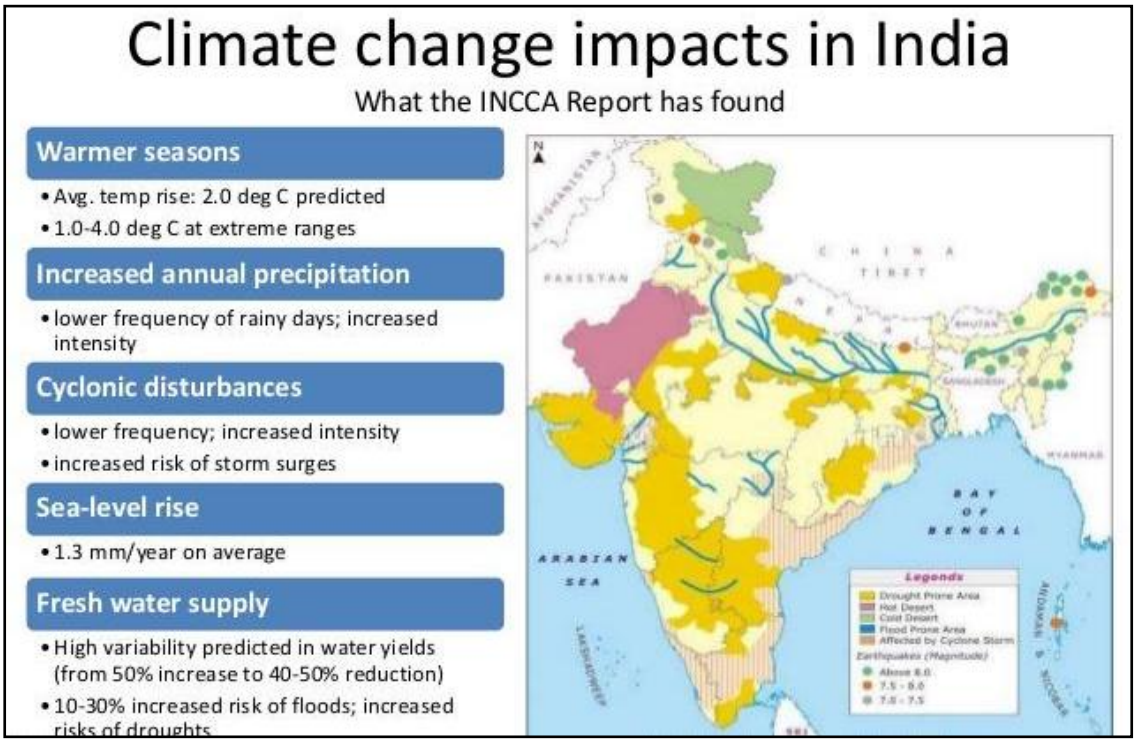
- **Biological sources:** Wetlands, poorly vented landfills, and submerged paddy field.

Agriculture:

- About 32% of methane emitted by humans is due to livestock emissions, including manure and gastroenteric. Methane is also released by cows.
- Another 8% of human-linked emission comes from paddy rice cultivation
- Emissions from fuel and industries
- **Recent Emissions from Permian Basin –** A new study published in Environmental Science & Technology estimates that over 9% of US gas production is located in Texas and New Mexico. as emissions.
- This is in contrast to the 1.4% prediction by the US Environmental Protection Agency.

Topic 19. HOW CAN INDIA REDUCE ITS IMPACT ON GLOBAL WARMING

Important for subject: Environment



The U.S. Environmental Protection Agency has stated that human activities have emitted large amounts of carbon dioxide (CO2) since 1800. This was due to fuel combustion and other 'greenhouse gas' compounds such as methane and nitrous oxide. These greenhouse gases are changing the climate of the earth.

Alarming rise

- The atmospheric carbon dioxide levels have risen by more than 40% from 280 ppm during the 18th century up to 414 in 2020. In addition, greenhouse gases (GHGs) have increased by more than 200 years.
- According to the Food and Agriculture Organisation (FAO), 70% of our country's population lives in rural areas. Their main occupation is agriculture. We have a total foodgrain output of 275 millions tonne.
- India is the second-largest producer of rice, wheat and sugarcane as well as cotton and groundnuts.
- Therefore, it is important that India reduces its carbon footprint in its agriculture sector.

Efforts to lower GHG emissions from agriculture

- Solar panels are used in agricultural fields to reduce the need for diesel fuel pumps.
- Climate-friendly Agriculture is more sustainable and offers new income streams.
- India could see its carbon emissions drop by 4562 millions tonnes per year.
- Rural farmers have been helped by the government and professionals to install solar panels in order to save money and increase their income.
- India's vast coastline is home to many fish species. Fishes are high in nutritional value and reduce carbon footprint.

India's agricultural output

- Indian farmers produced 121.5 million tonnes rice and 109,000,000 tonnes wheat in the period 2020-2021.
- They also produce other foodsgrains like millets (bajra), cassava, and many more.
- They produce approximately 12 million tonnes of millets each year.
- The annual production of maize is approximately 28.6 millions tonnes.
- You may also notice that millets contain more protein (7.3 m/100 g), fat (1.75 g/100 g) as well as fibre (4.22g/100g) than rice (protein content is 2.7 g/100 g, fat content is 0.3 g/100 g and fibre content is 0.4 g/100 g).
- Therefore, it is healthier to include more millets in our diets, along with wheat and rice.

- Wheat is better than rice because it contains more protein (13.2 g for 100 g), fat (2.5 g for 100 g) and fibre (10.7 grams per 100g).

Topic 20. IN GROUNDWATER NEAR A DELHI LANDFILL- HEAVY METALS LIKE LEAD AND CADMIUM

Important for subject: Environment

WHAT TESTS SHOW

Parameter	Result	Acceptable limit	Permissible limit
HANDPUMP 1			
Total dissolved solids	2016.8 mg/litre	500 mg/litre	2000 mg/litre
Hardness (as calcium carbonate)	736 mg/litre	200 mg/litre	600 mg/litre
Total alkalinity	750 mg/litre	200 mg/litre	600 mg/litre
Cadmium	0.015 mg/litre	0.003 mg/litre	-
Lead	0.26 mg/litre	0.01 mg/litre	-
Total coliform*	21 MPN/100 ml	Shall not be**	-
HANDPUMP 1			
Total dissolved solids	2148 mg/litre	500 mg/litre	2000 mg/litre
Hardness (as calcium carbonate)	704 mg/litre	200 mg/litre	600 mg/litre
Total alkalinity	750 mg/litre	200 mg/litre	600 mg/litre
Cadmium	0.013 mg/litre	0.003 mg/litre	-
Lead	0.5 mg/litre	0.01 mg/litre	-
Total coliform*	<2 MPN/100 ml	Shall not be**	-

*Most probable number per 100 ml **Shall not be detectable in any 100 ml sample

The National Human Rights Commission (NHRC), in May 2022, sent notices to the Secretary, Union JalShakti Ministry and Chief Secretary of Delhi government. They asked for detailed reports about groundwater contamination near Delhi landfill sites and proposed steps to address the problem.

- A NABLaccredited laboratory tested groundwater samples taken from the Bhalswa dump. These are the results: Lead up to 50x the acceptable limit, cadmium as high as seven times-- this is the analysis of groundwater close to Bhalswa landfill.

Source of toxicities

- Ingestion, inhalation or contact with skin or other contaminated materials can all be sources of toxicity.
- Because lead and cadmium are used in many products, both at home and in industry, there are multiple sources.

- Plastic is a major source of plastic. Both lead and cadmium can be used as stabilizers.
- It can be very harmful to the environment if you dispose of a lot.
- These metals could be found in electronic products, batteries and circuits for lights, which were dumped at the site.
- All of these metals might be found in paints and pigments.
- Water toxicity and its impact
- These heavy metals are why they are
- Cadmium can cause cancer in the prostate and lungs.
- Anaemia caused by lead can be characterized as a haemoglobin deficiency.
- The body has a limit on how much lead it can absorb. Anything beyond this level can lead to iron deficiency.
- Cadmium can also cause kidney damage. It can also cause kidney tubular defects.
- It can lead to developmental abnormalities in children.
- The following was the result of an analysis by the Centre for Science and Environment.

Submersible pump:

- High levels of total dissolved solids (TDS), approximately 5 times the permitted limit, hardness, heavy metallics like lead and cadmium, as well as total alkalinity, were all above acceptable limits.
- This water can cause contamination if it is used for vegetable growing.
- Local bodies respond
- The Municipal Corporation of Delhi (MCD) was emailed a list of questions. The MCD's plans for addressing groundwater contamination from the landfill.
- The spokesperson for MCD stated that the civic body had begun biomining legacy waste in order to clean the dumpsite.
- The MCD was asked if the MCD knew of groundwater contamination due to leachate from Bhalswa's landfill.

Way ahead

- It is expensive to clean the aquifer.
- It's difficult to clean if it has been contaminated by heavy metals or other bacteriological contaminants.

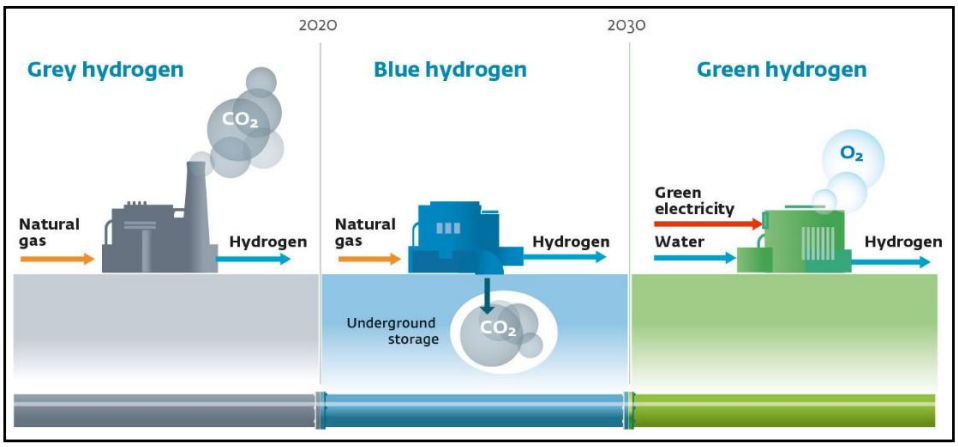
- However, if TDS or hardness is high, groundwater recharge can be beneficial in improving quality.
- Only one day a week is the best time to get water from the pipes.
- There are informal sector operators that reprocess some waste in the areas surrounding landfills.

WHAT DO THESE PARAMETERS MEAN?

- **TOTAL DISSOLVED SOLUTIONS:** Inorganic and organic matter that is dissolved in water. This includes calcium, magnesium, sulfurate, and chlorides. The World Health Organisation states that TDS in water supplies are derived from natural sources, sewage, urban, agricultural, and industrial runoff and wastewater.
- **TOTAL COLIFORM:** Total coliforms can be found in soil, water that has been affected by surface water, or in animal or human waste. Although these bacteria do not cause serious illness, they can be used to identify other pathogenic organisms from feces in water.
- **LEAD, CADMIUM:** Heavy metals. These metals can be toxic or carcinogenic. Sources include industrial solid waste dumping into groundwater and leaching into groundwater via rainwater.
- CPCB 2007 report on groundwater quality.
- **SULPHATE, CHLORIDES AND BICARBONATES, ALONG WITH CALCIUM and MAGNESIUM INCREASE HARDNESS of WATER:** These inorganic dissolved sodiums are. CPCB 2007 groundwater quality report

Topic 21. GREEN STEEL

Important for subject: Environment



Green steel: How India can decarbonize the sector

Steel sector

- The Indian steel industry is a vital part of India's economy. It has been the backbone for its industrial development.
- Over 75% of steel is still made in coal-fired blast kilns. These blast furnaces release large quantities of carbon dioxide into our atmosphere.

What is green steel?

- Green steel, in essence, is the production of steel without using fossil fuels.
- One solution to reduce carbon emissions in the steel industry is so-called "green hydrogen".

Transitions in India's steel sector

- The country's iron- and steel sector is currently financially weak. Over 80 percent of the country's resources are located in the states Odisha, Jharkhand West Bengal, West Bengal, Chhattisgarh, and the northern regions Of Andhra Pradesh.
- The non-conventional energy sources available in the region have been well utilized by the western states of Gujarat, Maharashtra, and Karnataka.
- Once the greening of grid occurs, this can be further developed.
- The green energy transition in India could be made easier if eastern India has a clean steel sector.

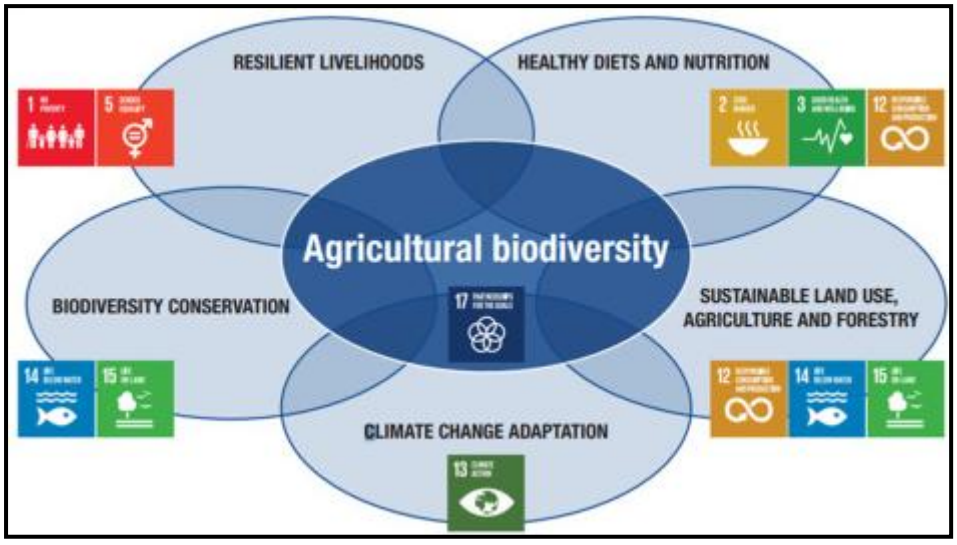
Sector decarbonisation: Green steel

- To decarbonize the iron and steel industry, technological interventions should be centered on replacing primary production processes with more efficient alternatives.
- Three main methods to make steel from iron using clean technology are carbon capture, utilisation, and storage (CCUS).
- Low-carbon hydrogen can replace conventional energy sources
- Electrolysis of iron ore can be used to electrify direct.
- There are several interventions that should be investigated:
- It is important to allow the adoption of cost-effective technologies to increase energy efficiency.

- Many plants are old and need to be restored.
- These plants can be made more efficient by using efficiency measures that are commonly used.
- As the grid gets greener, electricity-based manufacturing methods will continue to be green.
- The increase in scrap use helps to lower the energy required for steelmaking, as it can be added with basic oxygen furnace methods and electric arc furnaces.
- Construction of a recycling infrastructure
- India's Perform Achieve Trade program, which allows for the trading of energy efficiency certificates between designated consumers, has been a success.
- These include the iron- and steel sector.

Topic 22. AGROECOLOGY FOR PRESERVING AGRO-BIODIVERSITY

Important for subject: Environment



Half of all domestic animal breeds have been lost. The FAO estimates that only nine species of plant produce 66% of the total crop production. This despite the fact there are more than 30,000 edible plants.

- According to the United Nations Environment Program, agro-ecology is "an ecological approach towards agriculture that uses low-external input farming."
- Other terms, such as eco-agriculture or regenerative farming, are also used.
- Agro-ecology goes beyond just the practice of farming. It also focuses on social change, empowerment, and maximizing short value chains.

- It allows farmers adapt to climate change and sustainably use and preserve natural resources and biodiversity.
- Agro-ecology is simply a celebration of crop diversity.
- It is interested in low-energy external inputs, agroecological services such as enterprises, soil cover for a long period of time through multiple crops, niche crops, and regional markets.
- Prime Minister, calling for less pesticides and fertilizers "as great steps for saving mother Earth" on August 15, 2019, and reiterating his "Vocal for Local", idea, captures the essence and purpose of agroecology. It also meets 12 of the 17 UN Sustainable Development Goals.
- Rain-fed areas offer nutrition security via millets, pulses, and oilseeds. Rain-fed crops are less productive than their irrigated counterparts. Therefore, programs that improve rain-fed crop productivity screen for traits such as resilience and increased productivity.
- These are the majority of the endemic, cultivable land species of these areas. Ephemerals are plants that last a short time, and they live in rain-fed areas.
- Agro-ecology could be an option in areas that are rainfed.
- Dryland agriculture refers to the cultivation of crops only under rainfed conditions.
- Dry farming is the cultivation of crops in areas with less than 750mm of annual rainfall.
- Crop failures are most commonly caused by prolonged dry spells in the crop period.
- These are areas that have a shorter growing season (period with adequate soil moisture) than 75 days.
- **Crop production requires moisture conservation.**
- b) **Dryland agriculture:** This is the cultivation of crops in areas with more than 750mm of annual rainfall.
- Despite prolonged dry spells, crop failures are relatively rare.
- These semiarid tracts have a growing period of between 75 and 120 days.
- Crop production requires moisture conservation.
- For vertisols and black soils, however, it is important to have adequate drainage.
- c) **Rainfed agriculture:** This is crop production in areas with more than 1150 mm of annual rainfall.
- The emphasis is often placed on the removal of excess water.

- These are regions that have a longer growing period than 120 days.
- Dry farming and dryland agriculture emphasize soil and water conservation, sustainable crop yields, and limited fertilizer usage according to soil moisture availability.
- Rainfed agriculture focuses on water conservation, crop yield maximization, high inputs, and controlling water erosion.

Topic 23. SAGA OF FREEDOM: KNOWN & LESSER-KNOWN STRUGGLE

Important for subject: History

The National Archives of India extended the exhibition until 30 October 2022.

- There have been many revolutionary struggles and movements in different parts of the country, including:
- Revolt of Jungle Mahal, or Chuar Uprising (1771- 1809) (West Bengal), Sambalpur Revolt, Odisha (1827-62),Great uprising (1857), Kuka Namdhari Movement, Punjab (1871), Assassination of Plague Commissioner, Pune (Chapekar Brothers 1897), Munda Revolt, Ranchi (1894), Anushilan Samiti (1902), Alipore Bomb Conspiracy Case (1908), Howrah Gang Case (1910), Delhi-Lahore Conspiracy Case (1912), Ghadar Party 1913, Champaran Satyagarah (1917), Non-Cooperation Movement (1920), Chauri Chaura (1922), Rampa Rebellion, Visakhapatnam, Andhra Pradesh (1922-24), The Hindustan Socialist Republican Association (HSRA) 1923, Kakori Conspiracy Case (1925), Navjavan Sabha (1926-31), Kirti Kisan Movement, 1927, Chittagong Armoury Raid (1930).
- Civil Disobedience Movement/ Dandi March (March 1930), Central Assembly Bomb Case (1929), & Lahore Conspiracy Case(1931), Hareka Movement (Rani Gaidinliu 1930), The Indian Independence League (1820s to 1940s), Quit India Movement (1942), and Royal Indian Navy Rebel 1946, etc.

National Archives of India

- The National Archives of India holds the records of enduring importance of the Government of India (Under Ministry of Culture).
- It was established as the Imperial Record Department in Calcutta (Kolkata), on March 11, 1891.
- It is the largest archival repository of South Asia.

- It has a vast corpus of records viz., public records, private papers, oriental records, cartographic records and microfilms, which constitute an invaluable source of information for scholars-administrators and users of archives.
- The National Archives holds 40kms worth of shelf space and is a regular series that began in 1748.
- The Public Records Act 1993, and the rules thereunder, have been implemented by the Director General of Archives.
- These rules are the Public Records Rules 1997, which govern the management, administration, and preservation of public records.

Topic 24. CONTRIBUTION OF MAHATMA GANDHI IN FREEDOM MOVEMENT

Important for subject: History

On October 2, Gandhi Jayanti is observed all across the country.

- Mahatma Gandhi was conceived in Porbandar, Gujarat, on 2 October 1869.
- Mahatma Gandhi, a well-known freedom activist, was an integral part of India's struggle to become independent from the British.
- His philosophy of truth and nonviolence was influential on many people and was adopted by Martin Luther King and Nelson Mandela as part of their struggle movement.

Early life:

- Mohandas, aged 19, left his home in India to study law at London's Inner Temple. This is one of four colleges that the city has.
- He returned to India in the middle of 1891 and set up a Bombay law office, but he was unsuccessful.
- Soon he accepted a job with an Indian company that sent him to South Africa.
- Gandhi, Kasturbai and their children remained in South Africa almost 20 years after his marriage.
- Books that inspired Mahatma Ghandi: Unto this Last by John Ruskin, and The Kingdom of God Is Within You' by Leo Tolstoy.
- John Ruskin, an English artist, wrote Unto This lastinspired Gandhi. He also established Phoenix Farm near Durban.
- Gandhi would instruct his cadres here on peaceful restraint and non-violent

Satyagraha.

- The birthplace of Satyagraha is Phoenix Farm. It was however at the Tolstoy farm, Gandhi's second camp, South Africa, that Satyagraha was made into a weapon for protest.
- Associations of Gandhiji in South Africa
- Natal Indian Congress
- Passive Resistance Association
- South Africa Journals by Gandhiji
- Indian Opinion

Gandhiji in India:

- After returning from South Africa in 1915, Mahatma Gandhi had perfected non-violent resistance, or satyagraha. He spent the next few decades studying Indian conditions and traveled extensively across this vast country.
- Gandhi met with the Congress leadership, took their suggestions on board and began to take tentative steps towards his entry into the Indian Independence struggle.
- Although the Indian freedom movement may be viewed as a single battle that lasted for decades, there were many phases and periods of relative quiet.
- Gandhi, apart from being the most vocal advocate for peace and violence, was also an exemplary organizer of mass movements. He was able to sense the pulse of the people like no other.
- These are the movements that he initiated and led, and which eventually and cumulatively shaken the foundations of British Raj.
- **Champaran Movement:** India's first civil disobedience movement, the Champaran Movement.
- It was held in northern Bihar's Champaran district.
- Indian laborers and farmworkers were responsible for tilling the land, but the European landowners received all the profits.
- Although the labourers protested, it was Gandhi's participation in their struggle that resulted in 1918's Champaran Agrarian Act.
- This Act gave farmers greater rights over their land.
- Champaran's success made Gandhi and his principles more widely known to Indians, and the Congress party was able to find its most popular leader.

- Satyagraha, Ahmedabad Mill Worker: In March 1918, Gandhi led a strike at the cotton mills.
- Gandhi used the weapon known as Hunger strike in this strike.
- **Kheda Satyagraha -** Despite crop failures in Kheda (Gujarat), the farmers' desperate pleas to get tax relief were ignored.
- Gandhi advised them to withhold income and to fight bravely and peacefully against such vindictiveness.
- SardarVallabhbhai Ptel, another rising star in the freedom movement played a crucial role in the 1918 struggle.
- The solution was eventually reached by the local government.
- Although the Champaran-Kheda campaigns were restricted to a few areas, they gave Gandhi the confidence to launch major pan-Indian movements.
- **Rowlatt Act Satyagraha :** The British government of India created a number of emergency powers during World War I (1914-18). These powers were meant to counter subversive activities.
- The Anarchical and Revolutionary Crimes Act of 1919, also known as the Rowlatt Act (Black Act), was passed on March 10, 1919.
- It allowed the government to detain or imprison anyone associated with seditious activities that led to widespread unrest.
- Gandhiji demanded a one-day general strike throughout the country (Rowlatt Sathyagraha).
- Non-Cooperation Movement. Gandhi's first mass movement, the Non-Cooperation Movement (1920-22), sought self-government or swaraj to all Indians.
- It was Gandhi's deep-held ideals of satyagraha, civil disobedience and civil disobedience that led to it. He called on Indians to boycott all British institutions, including colleges and courts, to give up their titles, and to refuse to pay taxes.
- Although the Non-Cooperation movement was bold in its scope, it wasn't a 100% success.
- However, it helped millions of Indians to understand the true meaning and power of an organised, modern political movement.
- **Dandi March:** A unqualified masterstroke, Mahatma Gandhi's political genius as well as his timing sense brought the Dandi March to the forefront.
- In March 1930, he began the historic march starting from Sabarmati Ashram and

ending at Dandi on the coast.

- Although the main purpose was to protest the British salt tax, the march became something bigger when thousands joined Gandhi's 24-day march.
- The Dandi march became the talk of the nation and inspired the entire nation.
- For the remainder of the Raj's remaining years, non-violent resistance to the British was the only way for large sections of Indians to act.
- **Quit India Movement:** The British knew their days in India were over by the 1940s. But they used World War 2 as an excuse to delay any talks of India becoming independent.
- The All-India Congress Committee adopted the famous "Quit India" resolution in Bombay under the leadership Mahatma Gandhi who also used the slogan of "Do or Die".
- Although the entire Congress leadership was taken into custody, it didn't stop thousands protesting British rule from every corner of the country.
- There was no other way: India was ruled by the British.

Gandhiji's journals

- Mahatma Ghandi was given editorship by Young India and Navjivan
- In February 1933, Gandhiji founded Harijan and Harijanbandhu, Harijansevakin English Gujarati, Hindi, Organizations by Mahatma Gandhi Harijan Sevak Sangh. All India spinners association. Ahmedabad Textile Labour. All India Village Industries' Association.

Topic 25. HINDU MAHASABHA

Important for subject: History

The All India Hindu Mahasabha organized a Durga Puja in Kolkata. It depicted the "asura" as a dhoti-clad, bald man with walking sticks, and looked similar to Mahatma Gandhi.

Hindu Mahasabha

- Akhil Bharat Hindu Mahasabha, which was founded in 1907, is one of India's oldest organizations.
- This Organization was established by eminent leaders in 1915 on an All India basis.
- It emerged as a separate party in the 1930s under Vinayak Damodar Svarkar. He developed the extreme-right ideology of Hindutva and became a fierce opponent to the secular nationalism advocated by Congress.
- The Mahasabha supported British war efforts during the Second World War and briefly joined coalitions with the Muslim League in central and provincial councils.
- It opposed the Quit Indian Movement and supported British.
- The party was opposed to India's 1947 partition and demanded the creation of a secular, united state called Hindustan with the same rights as citizens of all religions.
- Pandit Madan Mohan Malaviya and Lal Lajpat Rai were the Eminent Persons who established this Organisation and presided over the All India Sessions, Veer Vinayak Dar Savarkar, etc.

Topic 26. CHOLA DYNASTY

Important for subject: History

About Chola Dynasty

- The Cholas (from 8th to 12th centuries AD) are a long-standing ruling dynasty in the southern region of India.
- In the 9th century, the Cholas seized power after defeating the Pallavas. This rule lasted for five centuries, ending in the 13th century.
- The medieval period was a time of absolute power and development in the Cholas' history.
- Parantaka and Aditya I were kings at this time.
- Rajaraj Chola, Rajendra Chola, and Rajendra Chola expanded the kingdom to the Tamil region.
- Kulothunga Chola later took over Kalinga in order to establish a strong ruler.
- Prominent Monarchs:
- **Vijayalaya:** Vijayalaya founded the Chola Empire. In the 8th century, he took control of Tanjore and led to the rise in power of the Cholas after defeating the Pallavas.
- **Aditya I:** Aditya II succeeded Vijayalaya as the ruler of the empire. He defeated King Aparajita, and the empire gained immense power under his rule.
- He defeated the Pandya Kings and the Vadumbas, and established control over Pallavas' power throughout the region.
- Rajaraja Chola, the most famous and powerful king of the medieval chola-dynasty.
- He was responsible for consolidating the chola power of southern India. He constructed the Tanjore Big Temple, dedicated to Lord Shiva.
- **Rajendra Chola:** He succeeded Rajaraja Chola.
- Rajendra I was first to cross the Ganges.
- He was known as the Victor of Ganges.
- This time is known as the golden age for the Cholas. The kingdom suffered a wide-spread decline after his rule.
- Governance and administration
- The entire southern region was brought under one governing force during the Cholas' governance.
- The Cholas ruled as a sustained Monarchy.
- The vast kingdom was divided into several provinces, which were called mandalams.
- Each mandalam was assigned a governor.

- These were further divided into nadus, which contained tehsils.
- During the Chola era, each village was a self-governing unit.
- Cholas were avid patrons of poetry, art, and drama.
- The administration invested in several temples and complexes with paintings and sculptures.
- The central authority that would make major decisions and oversee the governance was the king.

Architecture:

- The Dravida style was best known for its Chola architecture (from 871 to 1173 AD).
- They created some of the most magnificent temples in medieval India.
- Chola temples like Brihadeshwara temple, Rajarajeshwara temple, GangaikondaCholapuram temple took Dravidian architecture to newer heights.
- Even after the Cholas, temple architecture thrived. Cholas Sculpture
- The sculpture of Nataraja performing the Tandava dance pose was an important Chola piece.
- Although the oldest known Nataraja statue, found at Ravanaphadi cave in Aihole was created during the Chalukya rule early on, it reached its peak under Cholas.
- This sculpture depicts Bhudevi (or the earth goddess, as the younger consort to Vishnu) in the later stage of Chola art.
- The sculpture shows her standing gracefully on a lotus pedestal, holding a lily in one hand and the left arm hanging along her side.
- Images of Chola bronze are regarded as some of the most beautiful in the world.

Topic 27. US SANCTIONS INDIAN COMPANY

Important for subject: International Relations

A petrochemical company was accused of selling Iranian petroleum products.

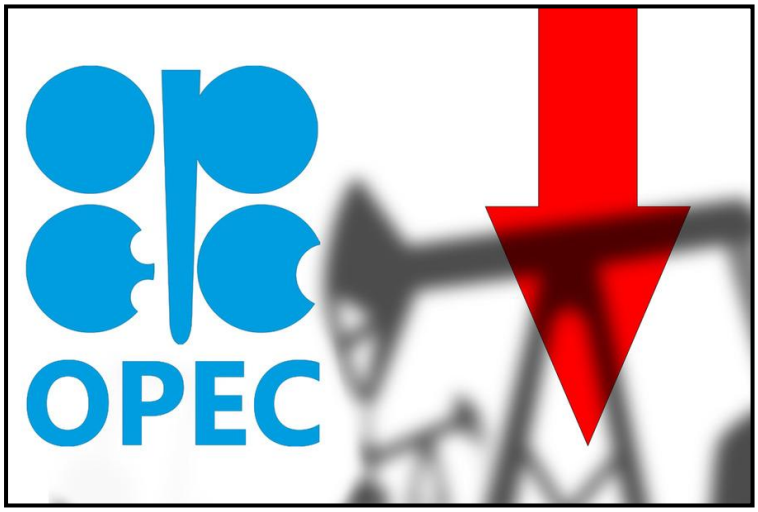
- The US Treasury department has announced that sanctions will be continued against these companies until Iran complies fully with the JCPOA agreement.
- 2015 Joint Comprehensive Plan of Action (JCPOA).
- The JCPOA was formed from long-running negotiations between Iran and the P5+1 (China France Russia Russia) in 2013 and 2015.
- Iran was required to drastically reduce its stockpiles of heavy-water, enriched

uranium, and centrifuges as key components of nuclear weapons.

- Iran also agreed that it would implement a protocol that would permit inspectors from International Atomic Energy Agency to access its nuclear sites in order to prevent Iran's secret development of nuclear weapons.
- The West has agreed to lift sanctions on Iran's nuclear proliferation. However, sanctions on alleged human rights violations and Iran's missile program remain in effect.
- Although the US promised to lift sanctions on oil exports and continue to restrict financial transactions, they have stopped international trade with Iran.
- After years of inflation, currency depreciation and recessions, Iran's economy stabilized after the agreement was in effect.
- Iran's exports also increased significantly.
- America's closest ally, Israel, strongly opposed the deal.
- Other countries, like Saudi Arabia, a great regional rival, also complained about their inability to participate in negotiations despite the fact that Iran's nuclear program poses security risks for all countries in the region.
- Trump ended the deal and reinstated oil and banking sanctions. Iran then ramped-up its nuclear program in earnest and returned to 97% of its pre2015 nuclear capabilities.

Topic 28. OPEC-PLUS AGREES ON 2 MILLION-BARREL-A-DAY CUT TO OUTPUT LIMIT

Important for subject: International relations



Wednesday's decision by the OPEC+ alliance, oil-exporting nations, to reduce production to support sagging prices of oil was a sign of trouble for the global economy. It could also raise

political pressures on American drivers to pay higher prices just before key national elections.

- OPEC Plus is the designation for non-OPEC nations that export crude oil. OPEC Plus Countries include Azerbaijan (Bahrain), Brunei, Kazakhstan Malaysia, Mexico Oman, Russia South Sudan, Sudan, and Oman.
- In 2016, the OPEC and non OPEC producers formed an alliance.
- This was at a historic meeting in Algiers.
- OPEC's 14 members have control over 35 percent of the world's oil supplies and 82 percent of its proven reserves.
- With the addition of 10 non-OPEC countries to OPEC+, including important countries such as Russia, Mexico, and Kazakhstan, the share of holdings has risen to 55 percent percent and 90 percent, respectively.
- This gives OPEC+ a higher level of influence on the global economy than OPEC members.

Topic 29. PAHARI COMMUNITY

Important for subject: Social Issue

Paharis are eagerly awaiting Amit Shah's J&K trip, hoping to gain his support on Scheduled Tribe status.

- The latest moves of the BJP are designed to win the trust of Gujjars, Paharis in J&K ahead the Assembly elections. All eyes are now on Union Home Minister Amit Sharma's two-day visit the Union Territory.
- Gujjars and Bakerwals are non-Kashmiri speaking communities in J&K. There is a long-standing demand to include these communities under Scheduled Tribes.

Pahari Community

- The Pahari community is a linguistic group that resides mainly in the Pir Panjal Valley, which includes Rajouri and Poonch district.
- Paharis can also be found in Kashmir valley.
- Paharis include both Hindus as well as Muslims, unlike Bakerwals or Gujjars who are two of the most prominent nomadic clans.

Gujjars, Bakarwals

- Two distinct ethnic nomad groups, the Gujjars or Bakarwals, raise flocks of goat and sheep at high altitudes in the Western Himalayas.
- These groups move to the upper reaches of the valley in summer and to the lower reaches of winter to escape the cold.
- These people live in the hills of the North-Western Himalayas.
- The PirPanjal range is a collection of mountains located in the Lesser Himalayan area. It runs from east-southeast to west-northwest across the Indian states of Himachal Pradesh and Jammu and Kashmir, as well as the Pakistan-administrated Kashmir.
- The Himalayas are gradually rising towards the PirPanjal and Dhauladhar ranges.
- PirPanjal is one of the most extensive ranges in the Lesser Himalayas.
- It is located near the Sutlej River and dissociates from the Himalayas.
- This range also contains the famous Galyatmountains.
- This region is connected to the Valley of Kashmir by Mughal Road. It was once the historical link between Kashmir and India.
- DeoTibba (6.001 m (19.688 ft.) and Indrasan (6.221 m (20.410 ft.) are two notable peaks at eastern end of mountain range.
- This range is home to Gulmarg, a hill station in Kashmir.
- The PirPanjal pass (also known as Peer Ki Gali), connects Kashmir Valley with Rajouri, Poonch and the Mughal Road.
- It is located to the southwest of Kashmir Valley and is the highest point on the Mughal Road, at 3,490m (11.450 feet).
- Jawahar Tunnel, a 2.5 km (1.66 mi) long tunnel through PirPanjal Mountain under the Banihal pass, connects Banihal to Qazigund on one side of the mountain

Topic 30. CRITERIA FOR SC STATUS IN INDIA

Important for subject: Social Issue/Constitution

Reservation Category	Reservation Quota (%)
ST	7.5
SC	15
OBC	27
EWS	10
Total	**59.50%**

The Supreme Court of India sought the Union government's most recent position on a series of petitions challenging the Constitution Order of 1950 (Scheduled castes). This order allows only members of Hindu, Sikh, and Buddhist religions to become SCs.

- Paragraph 3 of 1950's Constitution (Scheduled Castes Order) states that any person who practices a religion other than Hinduism (the Sikh, or the Buddhist) shall not be considered to be a member a Scheduled Caste.
- Constitution (Scheduled Castes Order) Order, 1950 was amended by the 1956 amendment and the 1990 revision to include Sikhs as well as Buddhists on this list.
- India's Schedule Caste Status
- Article 366(24), which defines the term "Scheduled castes", refers to castes, races, tribes, or parts of groups that are deemed by Article 341 to be scheduled castinges for purposes of this Constitution.
- The Indian Constitution, Article 341(1), gives the President the power to notify which castes are present in the country and which states fall under the Scheduled Castes category.
- Article 341 (2) of Constitution gives the Parliament the power to amend the SC/ST list, but not the state legislatures.
- A constitutional amendment is required for any change to the Scheduled Castes and Tribes lists.
- Only proposals that have been approved by the Registrar General of India as well as the National Commission for Scheduled Castes can be introduced in Parliament. The 1999 rules have been discarded by RGI, however.
- The SC list includes individuals who are very socially, educationally and economically backward.
- Scheduled castes refer to those castes that are listed in the Constitution (Scheduled Casses) order of Government of India, which was promulgated August 1950.

Topic 31. INDIA ABSTAINS ON SRI LANKA VOTE AT HUMAN RIGHTS COUNCIL

Important for subject: International Organisations

India abstained in voting on Sri Lankan resolution at the U.N. Human Rights Council. However, it observed that Sri Lanka's progress towards implementing its commitments to the 13 th Amendment and meaningful devolution as well as early provincial elections, remains "inadequate."

About the UN Human Rights Council

- The UN Human Rights Council, an intergovernmental body of the United Nations system, is responsible for strengthening protection and promotion of human rights all over the globe.
- In 2006, the United Nations General Assembly created the Council. It replaces the former United Nations Commission on Human Rights.
- As the Secretariat of the Human Rights Council, the Office of the High Commissioner for Human Rights is also known as the OHCHR.
- OHCHR's headquarters is in Geneva, Switzerland.

Members:

- It is comprised of 47 United Nations Member States, who are elected by UN General

Assembly (UNGA).

- Members are elected for three years with a maximum of two consecutive terms.
- The UNGA considers the contribution of candidate states to the promotion, protection and enforcement of human rights as well as their voluntary pledges or commitments.
- The Council's membership is determined by equitable geographical distribution.
- These seats are distributed in the following manner:
- African States: 13 Seats
- Asia-Pacific States: 13 Seats
- 8 seats in Latin America and the Caribbean States
- 7 seats in the West European and Other States
- Eastern European States: 6 Seats
- The term of the Council members is three years. They are not eligible to be re-elected immediately after having served two terms consecutively.

What is the 13th Amendment to the Constitution of Sri Lanka?

- It is the result of the Indo-Lanka Accord signed by President J.R. Jayawardene and PM Rajiv Gandhi in July 1987 to try and end the civil war.
- The 13th Amendment led to the creation and operation of Provincial Councils.
- A power-sharing agreement to allow all nine provinces of the country, which includes Sinhala majority areas to be self-govern.
- The provincial administrations are responsible for important subjects such as education and health, agriculture, land, and police.
- The provincial governments have not been able to make much progress due to restrictions on financial power and the President's overriding powers.
- Particularly, provisions regarding police and land were never implemented.

Topic 32. IAF GETS FIRST MADE-IN-INDIA LIGHT COMBAT HELICOPTERS

Important for subject: Defence

Monday was the official induction of Prachand's multi-role Light Combat helicopter (LCH) by the Indian Air Force.

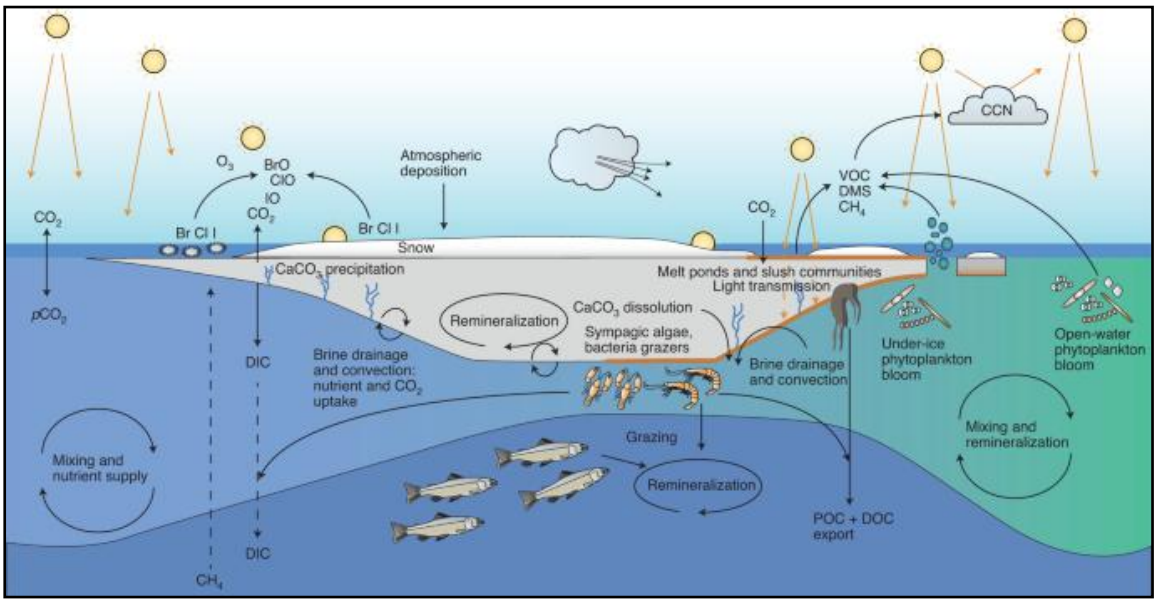
- After the Cabinet Committee on Security, headed by the Prime Minister approved the March procurement of 15 LCH Limited Series Productions (LSP) worth Rs 3,887 crore, along with allied sanctions worth Rs 377 Crore, the formal induction of LCH is

now complete.

- Light Combat Helicopters
- HAL Light Combat Helicopter (LCH), an Indian multi-role attack helicopter, was designed and manufactured in India by Hindustan Aeronautics Limited.
- Indian Air Force and Indian Army have ordered the LCH.
- It has the highest flight ceiling of all attack helicopters.
- Hindustan Aeronautics Limited (HAL) designed and built the twin-engine LCH. It is a dedicated combat helicopter of 5-8 tonnes.
- It is the only helicopter capable of landing and taking off at a height of 5,000m. The aircraft can carry a significant load of weapons, fuel and other equipment. This greatly increases the firepower of both the IAF (and the Army) in high-altitude regions.
- It is ideal for high-altitude operations, capable of engaging in counter-insurgency and destroying enemy air defense.

Topic 33. FAST-MELTING ARCTIC ICE IS TURNING THE OCEAN ACIDIC AND THREATENING LIFE

Important for subject: Geography



After discovering that the Arctic Ocean's western region is experiencing an increase in acidity, a team of scientists has identified the changes occurring. The levels have increased three to four times faster then ocean waters elsewhere.

- The team also found a strong correlation between ocean acidification and the acceleration of melting ice.
- This is the first Arctic acidification analysis to include data from 1994 through 2020, and it was published in Science, the journal of the American Association for the Advancement of Science.
- Scientists predict that the Arctic sea ice will not be able to survive the increasing heat in 2050.
- The ocean's chemistry will become more acidic, posing a danger to the many sea creatures, plants, and other living things that depend upon it.
- For example, crabs live in a crusty shell made from calcium carbonate, which is common in ocean water.
- Healthy fish populations are vital for polar bears. Fish and seabirds depend on plankton and other plants to survive, and seafood is an important part of many people's diets.
- Seawater has a pH value around 8.1.
- Sea-ice melt is the main mechanism behind this rapid pH drop, according to researchers. It changes surface water in three ways.
- The sea ice water, which was deficient in carbondioxide, is now exposed to atmospheric carbon dioxide and can absorb it freely.
- The seawater and meltwater are light, so they can't mix well into deeper waters. This means that the carbon-dioxide is concentrated at its surface.
- The melting water dilutes carbonate ion levels in seawater. This weakens its ability to neutralise carbon dioxide into bicarbonate, and accelerates ocean pH decline.

Topic 34. GOVERNOR'S ASSENT TO BILLS

Important for subject: Polity

Lately, the issue of Governor's assent has become controversial in at least two States, Kerala and Tamil Nadu.

- After much delay, the Governor of Tamil Nadu forwarded the Bill to exempt the National Eligibility cum Entrance Test from (NEET) to President.
- The situation in Kerala has turned a little strange after the Governor announced publicly that he wouldn't give his assent to the Lokayukta Amendment Bill or the Kerala University Amendment Bill.

- Only after the Governor has signed it into law, can a bill passed by the State Assembly become law.
- Because the Governor is a member of the State legislature the law-making process can only be completed when he signs it. This signifies his assent
- Assent to articles 200 (i.e. Assent of Governor to bills passed by state legislatures
- The Governor is required to give his assent to any Bill that has been passed by the legislature.
- The President appoints the Governor, which is the Union government.
- Article 154(1) of Constitution gives the Governor the executive power over the State. He is required to exercise this power in accordance the Constitution.
- The Governor cannot act without the advice and assistance of the Council of Ministers.
- There is little deviation from the Government of
- India Act of 1935, in the context of British era Governors' powers. It is a settled constitutional position the Governor is only a constitutional Head and the Council of Ministers exercises the executive power of State.
- After a bill has been passed by the state legislature, it can be sent to the governor.
- Or, give his consent to the bill.

Refuse to give his assent to this bill

- If it isn't a money bill, return the bill for reconsideration by the state
- The governor must give his approval to the bill if it is passed by the state legislature again with or without amends. Or, the governor may reserve the bill for consideration by the president (article 211).
- One case in which such a reservation is mandatory is when the bill passed by state legislature puts at risk the position of state high court.
- The governor can reserve the bill, if necessary:
- Ultra-vires are defined as those who go against the Constitution's provisions.
- Opposed to the Directive Principles of State Policy
- For the greater interest of the country.
- This is of vital national importance.
- The Constitution's Article 12 deals with the compulsory acquisition of property.