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— Disclaimer —

The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

CURRENT AFFAIRS ANALYST

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SECTION: A

(MAINS)

CURRENT AFFAIRS

LITHIUM AND ITS DISTRIBUTION ACROSS THE GLOBE

CONTEXT:

Argentina the fourth-largest producer of Lithium metal is now speeding up the process of mineral exploitation. Till now the extraction was done sluggishly due to high tax rates, red tape and rampant inflation.

BACKGROUND:

- The growing demand for white gold is climbing new height every day due to it being the ultralight battery metal.
- The other reason for the spike has been the global rush towards environmentally friendly modes of transport.
  - Among the top lithium producing countries, Argentina comesfourth in the list. This could make Argentina an important player in the electric vehicle supply chain.

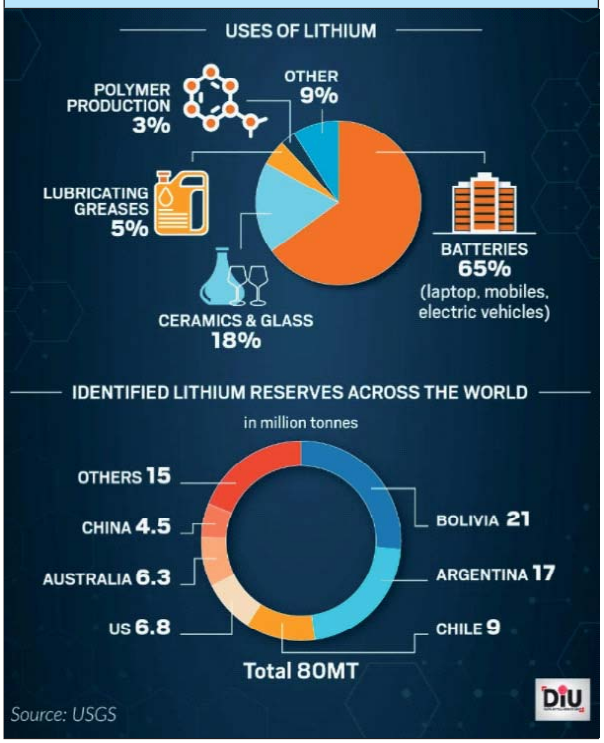
ANALYSIS:

Increasing demand for lithium metal:

- **Increased applicability:** In order to take advantage of renewable energy, the need for bulk energy storage applications has been increasing. This includes **electric vehicles (EVs)** and backup electric storage systems.
- **Good life:** Lithium-ion based batteries have a good rate of charging and they last longer.
- **Higher energy density:** In addition to this, the energy density of the Li-ion batteries is higher.
- **Wide usage:** Being primarily used in batteries, it also finds its use in glass, ceramics, rocket fuel and lasers.

About the Metal

- Lithium is a metal of utmost importance. It is everywhere today.
- A soft, silvery metal. It has the lowest density of all metals. It reacts vigorously with water.
- Lithium does not occur as the metal in nature, but is found combined in small amounts in nearly all igneous rocks and in the waters of many mineral springs.
- Spodumene, petalite, lepidolite, and amblygonite are the more important minerals containing lithium.
- Most lithium is currently produced in Chile, from brines that yield lithium carbonate when treated with sodium carbonate.
- The metal is produced by the electrolysis of molten lithium chloride and potassium chloride.



Lithium Triangle in Latin America:

- Lithium reserves have been found in all the continents but **Chile, Argentina and Bolivia** together are referred to as the **"Lithium Triangle"**- holding underneath in its salt flats more than 75 percent of the world supply. *(Figure 1.1)*

Natural salt pans or salt flats are the large flat area of ground covered with salt and other minerals. They are usually found in deserts, **Salar de Uyuni** in Bolivia is the largest salt flat in the world. They are not like salt evaporation ponds, which are artificial. Wind and water work in tandem to create a flat surface of salt.

- The Lithium Triangle being a part of the dry landscape makes the extraction of lithium a complicated process, as the miners have to drill holes in the salt flats in order to pump mineral-rich brine to the surface.

Figure 1.1

- The mineral-rich brine is then made to evaporate for months resulting in the residue of manganese, borax and lithium salts.
- These salts are then filtered again and left to evaporate once more.
- It takes 12 to 18 months for the filtration process to complete and then the lithium carbonate can be extracted.

Story of Argentina so far:

- In the ancestral land of Atacama's lies the stockpiles of white gold (silvery-white alkali metal),i.e., Lithium metal is worth of billions of dollars.
- Since 2018, the economy of Argentina is in crisis. It was the time when it approached to IMF for a $ 57 billion loan. It has faced many economic challenges, including rapid depreciation of the currency, economic contraction and a high rate of inflation.
- Argentina has an excellent source of lithium and it has the potential to compensate for the macroeconomic instability of the country.

India's stake involved in Argentina:

- **KABIL** has inked a pact with an Argentine firm to jointly look for the possibilities of finding lithium in a South American country.
- **KhanijBidesh India limited (KABIL)**, a joint venture was set up in 2019 by three state-owned companies, National Aluminium Company Limited (NALCO), Hindustan Copper Limited (HCL) and Mineral Exploration Corporation Limited (MECL) in equity participation of 40:30:30 respectively. Its mandate is to acquire strategic minerals assets like lithium and cobalt abroad. It is also exploring the other two countries of the lithium triangle, namely Bolivia and Chile.
- This can potentially decrease our dependency on China as the key source of both raw material and cells.

Lithium reserves in India:

- During 2021-22 **Geological Survey of India (GSI)** has carried out 7 projects on Lithium in Arunachal Pradesh, Andhra Pradesh, Chhattisgarh, Jharkhand, Jammu & Kashmir and Rajasthan. However, the resource of lithium has not yet been augmented by GSI.
- Researchers at the **Atomic Minerals Directorate (AMD)**for Exploration and Research,which is a constituent of Department Atomic Energy (DAE) has estimated lithium reserves of 14,100 tonnes in a small patch of land surveyed in Southern Karnataka's Mandya district.

Atomic Minerals Directorate (AMD) has the mandate of surveying, prospecting and developing of resources of uranium, thorium, niobium, tantalum, lithium, beryllium and Rare Earth Elements (REE) as these minerals are required for supporting the Nuclear Power Programme of India.

- Exploratory work has been done for extracting lithium from brine pools of Rajasthan and Gujarat have been published.
- The reports of mica belts of Odisha and Chhattisgarh have also been published. There are pegmatite (igneous rock) belts. Most of the pegmatites have a composition of quartz, feldspar, and mica.

Other available options:

- **Toyota's solid-state battery:** Toyota is the leader when it comes to holding the maximum number of patents involving **solid-state batteries**. If everything goes according to plans it is going to be the first company to sell an EV with a solid-state battery. It is planning to launch a prototype this year.
- **Apple battery tech:** Apple is targeting 2024 to unveil its breakthrough battery technology which could radically reduce the cost of batteries.
- **Quantum Scape's solid-state battery:** It's a California based battery start-up, with financial

backing from Volkswagen AG. They are the leading developers of solid-state lithium metal batteries.

- **Tesla's new tabless battery:** The tab is that part of the battery which makes the connection between the cell and what it is powering. These cells are also called 4860 cells. According to Tesla it can dramatically reduce the cost of EVs and bring its pricing at par with the conventionally powered ones.

⊙ CONCLUSION:

Climate has caused the world to bend its knees. In the pursuit of moving towards an environmentally friendly lifestyle, EVs are being projected as a potential solution. India is home to some of the most polluted cities in the world and may not be in a position to rapidly transform its fuel-based vehicles to EVs. We have to depend on external supplies for lithium metal and this makes us vulnerable to imports. We have set 350 GW by 2030 as our renewable energy goal. Steps like PLI **(Production Linked Incentive)** scheme for manufacturing **ACC (Advanced Chemistry Cell)** batteries goes a long way. However, India does not have enough reserves of lithium to achieve its targets. We have to speed up its discovery and exploitation in India and abroad **(initiatives like KABIL**) to make India self-reliant in the renewable energy sector.

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AUKUS SECURITY ALLIANCE

CONTEXT:

Recently, The U.S. the U.K. and Australia announced a new trilateral security partnership, AUKUS.

◉ ABOUT THE AUKUS PACT

- The historic grouping will advance strategic interests, uphold the international rules-based order, along with generating hundreds of high-skilled jobs.
- Under the first major initiative of AUKUS, Australia would build a fleet of nuclear-powered submarines with the help of the US and the UK, a capability aimed at promoting stability in the Indo-Pacific region.

◉ HIGHLIGHTS OF AUKUS ALLIANCE

- **Indo-Pacific Focus:** The AUKUS security team will focus on developing strategic interests in the Indo-Pacific region.
  - Although the US has openly denied that the collection is targeted at China, its Indo-pacific status makes it an ally against China's independent actions in the South China Sea.
  - The three countries alongside Canada and New Zealand already share a deep understanding of the Five Eyes partnership.
- **Transferring Nuclear Vessels to Australia:** As part of this program, Australia will acquire submarine-powered submarines with assistance from the UK and US.
  - The move is significant because the US has only shared marine chemical technology before, and it began in 1958 with Great Britain.
  - Nuclear power submarines are quieter than their standard counterparts but also more capable of being installed for longer periods of time and need to appear more frequently.
  - Apart from India's stated goal of acquiring more nuclear-powered submarines, it will lead to an increase in changes in Quad's undersea power and anti-submarine warfare.
  - Quad is a collection of India, USA, Australia and Japan.
  - Australia now has to join the top six-nation group - India, US, UK, France, Russia and China - using nuclear-powered submarines. It would also be the end of the world to have such submarines without having a nuclear power plant.
- **Multilateral Partnerships:** AUKUS will also include new building and integration meetings between the three countries, as well as partnerships in emerging technologies (using AI, quantum technology and underwater capabilities).

Why did China express its concern about the AUKUS Security Alliance?

China is delayed more by AUKUS than Quad and other Indo-Pacific arrangements for the following reasons,

- First, AUKUS aims to protect the strategic interests of the partner in the region across the two seas and 38 countries.
- Second, it is a message to China that the US will one day do the same to other countries in the region. Sharing military and critical skills such as cyber, artificial intelligence, and computum computing. It is a cause for concern in China, as these are the key areas in which China currently governs.
- Third, AUKUS is a security group, unlike QUAD, which is a communication group.
- Fourth, the Declaration marks a new decline in Australia-China relations. China is Australia's largest trading partner, with about US $ 200 billion trading in two ways. But the relationship has been strained over the past few years.

For these reasons alone, China called the new AUKUS alliance "extremely damaging to the peace and stability of the region".

What does the AUKUS Security Alliance mean in India?

- According to Indian Observers, the partnership is very beneficial to India. As India has been at the forefront of uniting the unity of the Indo-Pacific countries. Benefits include,
- **Develop Indian partners in the region:** QUAD means nothing but the skills development required by all its members, especially Australia and Japan. This will give Indian partners more confidence and confidence in their defensive skills.
  - AUKUS and the future US military base on Australian soil will support India's efforts to protect the Indo-Pacific.

- **Provide much needed time in India to build naval capabilities:** In addition, AUKUS will buy some valuable time for India to strengthen its rural military capabilities.
- **Develop India's ambitions for international relations:** Partnerships will allow India to demand more of its foreign policy and defence strategy.

CONCLUSION

India now has very little to worry about before maritime and AUKUS in the game. This new alliance could allow the three countries to strengthen their focus on the more difficult part of the world. The triangular side of AUKUS will be a major message to China, and it will come close to balancing China in the Indo-Pacific region.

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MURA-DRAVA-DANUBE (MDD) BIOSPHERE RESERVE

CONTEXT:

Recently, the UNESCO designated Mura-Drava-Danube (MDD) as the world's first 'five-country biosphere reserve'.

ABOUT MURA-DRAVA-DANUBE (MDD):

- This area crossing the biosphere boundaries runs along the Drava, Mura and Danube Rivers, which are separated by flood proof dyes in the floodplain and floodplain.
- Nature reserves provide an important tool for learning the various methods of flood management.
- The park covers 700 kilometres of the Mura, Drava and Danube rivers and extends to Austria, Slovenia, Croatia, Hungary and Serbia.
- The complete park area in the 'Amazon of Europe', makes it one of the most protected river areas on the continent.

SIGNIFICANCE

- **Different Types of Earth:** The Park is home to floodplains, gravel and sandy beaches, river islands, oxen and meadows.
- **Flowers & Animals:** It is home to the highest European continent of white breeding eagles with a white tail (more than 150 pairs).
  - Many endangered species such as the small tern, black stork, otter, beaver, and sturgeon are also found here.
  - It is also an important resting place for the annual migration of more than 250,000 migratory birds, according to the WWF.
- **Population:** About 900,000 people live in the reserve.

BENEFITS

- **Adoption in Sustainable Environmental Efforts:** This new park represents an important contribution to the European Green Deal.
  - It also has an impact on the implementation of the EU Biodiversity Strategy in the Mura-Drava-Danube region.
- **The purpose of Jesus**
  - Rehabilitation of 25,000 miles of rivers once
  - Protecting 30 percent of the European Union by 2030.
  - Push to Promote Sustainable Business Actions
  - The adoption of the MDD was the mandate of all five countries to jointly promote the protection and rehabilitation of the Mura-Drava-Danube area.
- **Cooperation of the Natural Cross**
- The Interred Danube Transnational Program funded by the Amazon of Europe Bike Trail project is an example of international efforts to promote environmentally friendly practices.
- The project is a long-distance cycling route that covers the world areas of the Mura, Drava and Danube rivers over 1,250 km.
- When you book this cycling trip, a portion of the money spent directly on the region's conservation programs.

Related Information

Biosphere Reserves in India

- Presently, there are 18 Biosphere Reserves in India, among which 12 Biosphere reserves in India find their place in UNESCO's List of Man & Biosphere Reserves Programme.
- The latest included under the MAB was 'Panna Biosphere Reserve' (Madhya Pradesh).
- There are 727 biosphere reserves in 131 countries, including 22 Tran's boundary sites.

Three Main Zones:

- **Core Areas:** It comprises a strictly protected zone that contributes to the conservation of landscapes, ecosystems, species and genetic variation.
- **Buffer Zones:** It surrounds or adjoins the core area(s), and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.
- **Transition Area:** The transition area is where communities foster socio-culturally and ecologically sustainable economic and human activities.

BAD BANK WILL HELP TO CLEAN UP THE BALANCE SHEETS

CONTEXT:

In a recent development Union Finance Minister Nirmala Sitharaman has made an announcement that the government is extending a guarantee of Rs 30,600 crore to the National Asset Reconstruction Company Ltd (NARCL) to help clear stressed loans.

⊙ BACKGROUND:

- This announcement is in line with the In Budget 2021-22 when the finance minister had announced for setting up of a bad bank to resolve the bad loans.
- **National Asset Reconstruction Company Limited" (NARCL)** has been incorporated under the Companies Act, which will be tasked to acquire stressed assets worth Rs 2 lakh crore from various commercial banks.
- Then another entity- **"India Debt Resolution Company Ltd (IDRCL)"**, will try to sell the stressed assets in the market. Jointly NARCL-IDRCL forms the new bad bank.

⊙ ANA LYSIS:

What is a Bad Bank?

- It is a corporate structure that takes charge ofthe toxic assets held by banks in a separate entity.
- It is established to buy non-performing assets (NPAs) from a bank and later selling them in the market.
- This relieves the commercial banks from getting rid of their stressed assets and enables them to focus on resuming their normal banking operations.

Need for a Bad Bank:

- To put it simply, commercial banks accept deposits and provides loans to their customers. The deposits are considered a **liability** because the bank is supposed to return the money to the depositor and also pay the interest on those deposits. On the contrary, the loans that banks give is considered as their **assets** because in this case, the bank can earn interest and this is the money that borrower will have to return.
- This business model is based on the idea that the earnings made by the banks by lending money to the borrowers will be more than what it would have to pay to its depositors. But in scenarios where the borrowers fail to repay the principal amount or the interest. This aggravates the risk of a loan converting into a **non-performing asset (NPA).**
- The overwhelming chunk of the NPAs is lying mostly with the public sector banks, owned by the government and hence by the public. To keep these banks running the government is sometimes forced to recapitalise them, using the taxpayer's money so that the bank can continue with the lending and funding economic activities.
- To set free the banks from these stressed assets or NPAs, the need for the creation of bad banks aroused. An entity where the stressed assets can be parked. Now the commercial banks can resume their usual business operation, especially lending and the bad bank would try to sell these assets in the market.

NPAs that banks have:

- The total bad loans in the Indian Banking system amount to Rs 8.35 lakh crore in March 2021. *(Figure: 1)*
- According to the World Bank data, the share of NPA to gross loans in Indian banking is significantly

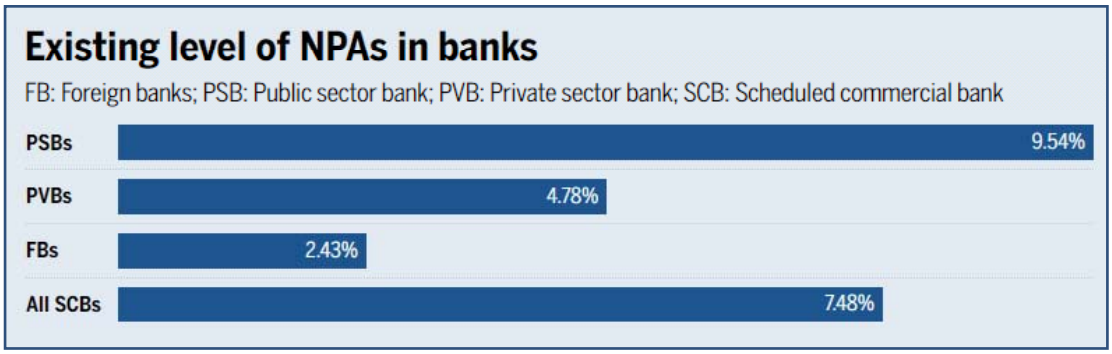

Figure:1

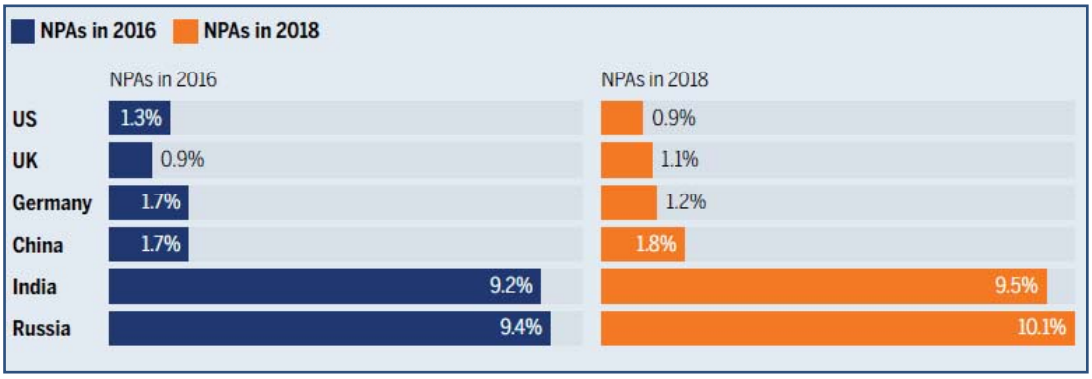

Figure:2

higher compared to developed western economies. *(Figure: 2)*

- According to the financial stability report issued by RBI, the (CRAR) of SCBs increased from 14.7 percent in March 2020 to 16 percent in March 2021.

CRAR is also known as Capital Adequacy Ratio (CAR) measures a bank's financial stability by measuring its available capital as a percentage of its weighted credit risk exposure. The Basel III norms stipulated a capital to risk-weighted assets of 8%.A higher CRAR shows that the bank is better capitalised to handle NPAs.

Working of NARCL-IDRCL:

- The transfer of bad loans will be done in a phased manner. Under this framework, the NARCL has purposed to acquire stressed assets of about Rs 2 lakh crore. **About Rs 90,000 crore worth of bad loans has been planned to transfer in the first phase.**
- At first, the NARCL will purchase bad loans from banks. It will pay **15% of the agreed price in cash** and the **remaining 85% will be in the form of "Security Receipts".** When the assets are sold in the market, with the help of IDRCL, the commercial banks will be paid back the remaining amount.
- If the bad bank fails to sell the bad loan or sells it at a loss then the government guarantee will be invoked and the difference between the price that the bad bank will be getting and what the commercial bank was supposed to pay will be paid from the corpus of Rs. 30,600 crores have been ensured by the government.

Concerns involved:

- From the perspective of the NPA laden bank, this move is going to help but from the perspective of the government and the taxpayer,the situation is a bit tricky.
- The burden of recapitalising the PSBs or giving guarantees for security receipts will always come from the taxpayer's pocket. This opens up a new topic for discussion "a new form of socialism for the capitalists", where the burden of the bad investments and business decisions of the borrower is transferred to the taxpayers.

Benefits:

- Consolidation of debts, single-point decision making in Insolvency and Bankruptcy Code (IBC) 2016.
- It will incentivise quicker action and resolution, thereby getting a better value realisation of the bad assets.
- Market expertise can be engaged for value enhancement.
- Banks will be able to focus on increasing business and credit growth.
- The government of India will enhance the liquidity of the Security Receipts (SRs) as it is being backed by them, also the SRs are tradable.

⊙ CONCLUSION:

The **4R strategy** of **Recognition, Resolution, Recapitalisation and Reform**, has positively contributed towards enhancing the performance of Public Sector Banks (PSBs). On these lines, the government made its intention clear to set up an **Asset Reconstruction Company (ARC)** along with an **Asset Management Company (AMC)** to take the charge of stressed debts and thereafter dispose of them to buyers for value realisation. The National Asset Reconstruction Company Limited (NARCL) and India Debt Resolution Company Limited (IDRCL) structure will consolidate the fragmented debt across the various lenders so that quicker can be taken for a better value realisation. In long run, the only sustainable solution to the problem of NPAs rests in improving the lending operation by PSBs, because that's where the problem begins.

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ARE COVID-19 VACCINE BOOSTERS ETHICAL?

CONTEXT:

In August this year, the US administration announced that a rollout plan was being put in place for COVID-19 booster shots.

However, this announcement raised ethical questions-

- Whether it's ethical for vaccinated people in the United States to get a booster when there are still so many people around the world waiting for their first dose of vaccine?
- Is giving these shots a fair and equitable way to distribute a lifesaving vaccine?

What is a COVID-19 vaccine booster?

- A COVID booster shot is an additional dose of a vaccine given after the protection provided by the original shot(s) has begun to decrease over time.
- Typically, a booster is given after the immunity from the initial dose(s) naturally starts to wane.
- It's objective is to help people maintain their level of immunity for longer.

Difference between a 'booster dose' and an 'additional dose'

- **Additional dose:** Sometimes people who are moderately to severely immuno-compromised doesnot build enough (or any) protection when they first get a vaccination. When this happens, getting another dose of the vaccine can sometimes help them build more protection against the disease.
- **Booster dose:** In contrast, a "booster dose" refers to another dose of a vaccine that is given to someone who built enough protection after vaccination, but then that protection decreased over time (this is called waning immunity).

What is a third dose of the coronavirus vaccine?

- A third dose of the mRNA COVID-19 vaccines (Pfizer or Moderna) is identical to the first two doses.
- It can help protect people with **weakened immune systems** who did not have a strong enough response to the first two doses of one of the mRNA vaccines.

Ethical argument for delaying COVID boosters

- It raises concerns about fairness, gross disparities between vaccine haves and have-nots.
- Moreover, it violates an **ethical principle of health equity.**
  - This principle holds that the world ought to help those who are most in need – people in low-income countries who cannot access a single dose.
- Some countries continue to struggle vaccinating their population in the first place.
- Giving out booster shots in countries with already high vaccination rates could lead to more dangerous coronavirus variants appearing across the globe.

A dangerous gap

- In some countries, such as Tanzania, Chad and Haiti, fewer than one percent of people have received a vaccine.
- Meanwhile, in wealthy nations, most citizens are fully vaccinated – 79 percent of people in the United Arab Emirates, 76 percent in Spain, 65 percent in the U.K., and 53 percent in the US.

Other side of the coin (the critical arguments)

- It is every nation's duty to protect its own people.
- Governments are justified in prioritizing their own residents until the risks of COVID-19 are similar to the flu seasons.
- One could argue that since rich countries have bought millions of doses, they are the rightful owners of those vaccines and are ethically free to do as they wish.

A purely utilitarian case

- There's also a purely utilitarian case to be made for delaying boosters.
- Even if boosters save lives and prevent severe disease, they benefit people far less than first shots, a notion known as diminishing marginal utility.
  - **For example**, the original laboratory studies of the Pfizer vaccine showed more than 90% protection for most people against severe disease and death after the primary, two-dose series. Booster shots, even if they boost

immunity, give much less protection: perhaps less than 10% protection

WHO's stand on boosters

- The WHO has called for countries to impose a moratorium on boosters until 10 percent of people in every country are vaccinated.
- The WHO's call is an appeal to fairness: the idea that it's unfair for richer countries to use up more of the global vaccine supply while 58 percent of people in the world have not received their first shots.

This is the time that the world must stand together in solidarity to end the pandemic.

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CURRENT AFFAIRS

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ASI DISCOVERED REMAINS OF AN ANCIENT TEMPLE OF GUPTA PERIOD

⊙ CONTEXT: **Recently, the Archaeological Survey of India (ASI) discovered remains of an ancient temple dating back to the Gupta period (5th century) in a village in Uttar Pradesh's Etah district.**

Key-findings

- Archeologists have found 'shankhalipi' inscriptions on the stairs on an ancient temple dating back to the Gupta period.
  - The stairs of the temple had 'shankhalipi' inscriptions, which were deciphered by the archaeologists, 'Sri Mahendraditya', the title of Kumaragupta I of the Gupta dynasty.
- As per the ASI, the stairs led to a structural temple built during the Gupta period.
- The team discovered two decorative pillars close to one another, with human figurines.
  - These two pillars were flat rectangular pillars, placed parallel and facing the same direction, and the front faces showed images of the yaksas, ganas, and various geometrical motifs.

What is the Shankhalipi script?

- Shankhalipi or "shell-script" is a term used by scholars to describe ornate spiral characters assumed to be Brahmi derivatives that look like conch shells or shankhas.
- They are found in inscriptions across north-central India and date to between the 4th and 8th centuries.
- Both Shankhalipi and Brahmi are stylised scripts used primarily for names and signatures.
- The inscriptions consist of a small number of characters, suggesting that the shell inscriptions are names or auspicious symbols or a combination of the two.

Significance of the discovery

- The discovery becomes significant since only two other structural temples from the Gupta age have been found so far —
  - Dashavatara Temple (Deogarh)
  - Bhitargaon Temple (Kanpur Dehat)

Gupta dynasty rulers

- Chandragupta 1 (320–330CE) -Chandragupta 1 was the founder of the Gupta empire. From being a local chief in Magadha kingdom, he increased his power by marriage alliances and wars.
- Chandragupta 2 (380–413 CE) -Chandragupta II The Great also known as Chandragupta Vikramāditya, son of Samudragupta, was one of the most powerful emperors of the Gupta empire in northern India.
  - ➤ Under his rule the Gupta Empire achieved its zenith, art, architecture, and sculpture flourished, and the cultural development of ancient India reached its climax.

MENHIR FROM MEGALITHIC PERIOD FOUND IN BASRUR

⊙ CONTEXT: **A menhir, an upright standing stone, has been found at Basrur in Udupi district.**

What are Menhirs?

- Menhirs are upright stones from the Megalithic period.
- They are erected above a burial site or near a burial site as a memorial.

Key-highlights of the discovery

- The discovery takes back the antiquity of Basrur to between 1,000 BC and 800 BC, which is the Megalithic period.
- The stone has a height of seven feet above the ground level.
- It was found on the roadside near the **Venkataramana temple.**

Basrur

- Basrur is a **medieval trading city** in coastal Karnataka.
- **Different names:** Basurepattana, Basurepura, Vasupura, Basaruru.
- The town is studded with many temples, which is an indicator of its splendid wealth.
  - ➤ The **Devi temple** of Basrur has special importance with the feast of Devi performed once every 60 years.
  - ➤ Mahalingeshwara temple, Kote Anjaneya temple, Tuluveshwara temple, Ramachandra temple, Umamaheshwara temple, Bhairava temple are the other surviving temples in the town in addition to Sadananda Mutt.

LENGTH OF MAMMOTH CAVE EXTENDED

⊙ CONTEXT: **Mammoth Cave National Park, home to the world's longest-known cave system, is now even longer. The legitimate length of Mammoth Cave has been extended to 420 miles. The extra mileage (8 miles) was mapped and documented through the Cave Research Foundation.**

About the Cave

- Mammoth Cave was created by the natural process of limestone erosion, known as **karst topography.**
  - ⊙ During this process, rain and rivers slowly dissolve and shape soft limestone, creating a vast system of caves.
  - ⊙ Underground rivers are still carving new passages today.
- **Location:** Mammoth Cave National Park, located in the nation of Kentucky (US).
- A giant roof of shale and sandstone form the upper cap of the cave system in Mammoth Cave.
- This rocky layer acts as an umbrella, preventing the slow dripping of water into the cave. It is the action of water that forms stalactites and stalagmites.
- Mammoth Cave is the world's longest cave system and a **UNESCO World Heritage Site.**

- Mammoth Cave was established as a national park on July 1, 1941.
- It received its official designation as the world's longest cave system in 1969. At the time, there were 65 miles of surveyed passageways.

VINOBA BHAVE BIRTH ANNIVERSARY

CONTEXT: **Prime Minister Narendra Modi paid tributes to Vinoba Bhave on his birth anniversary, saying he carried forward the noble Gandhian principles after India attained independence.**

About Vinoba Bhave

- Acharya Vinoba Bhave's original name was Vinayak Narahari Bhave.
- Birth: September 11, 1895, in a Chitpavan Brahmin family
- Birth Place: Gagoda village of the Konkan area of Maharashtra
- Nayak Narahari Bhave better known as Vinoba Bhave is regarded as the National Teacher of India.
- Vinoba Bhave had a deep sense of spiritualism instilled in him at a very young age by his religious mother.
- He learnt various regional languages and Sanskrit along with reading the scriptures.
- His mother, who hailed from Karnataka, had a major influence on him. He was inspired by her to read The Gita.

- Instead of appearing for an exam in Bombay in 1918, Bhave threw away his books in the fire. This happened after he read an article by Mahatma Gandhi.
- In 1940, Bhave was selected as the 'First Individual Satyagrahi' against the British Raj by Gandhi in India.
- Bhave played an important role in the Quit India Movement.
- Bhave took the vow for celibacy and followed it all his life. He dedicated his life to religious work and freedom struggle

Major contributions in independence journey

- He worked towards eliminating social inequities. He started the Sarvodaya Movement which meant 'Progress for all'.
- Took part in programs of non-cooperation and especially the call for use of Swadeshi goods instead of foreign imports.
- He also took part in nonviolent agitations against the British government, for which he was imprisoned.
- Bhave was imprisoned several times during the 1920s and '30s and served a five-year prison sentence in the '40s for leading nonviolent resistance to British rule. He was given the honorific title acharya ("teacher").
- He created the Brahma Vidya Mandir which was a small community of women that was created in order for them to become self-sufficient and non-violent in a community.
- He authored several books and was well-versed in many languages including Marathi, Gujarati, Sanskrit, English, Urdu and Hindi.
    - He learnt various regional languages and Sanskrit along with reading the scriptures.
- He was awarded the Ramon Magsaysay Award for Community Leadership in 1958.
- He received the Bharat Ratna posthumously in 1983.
- Vinoba Bhave died on 15 November 1982 due to a serious illness.

Bhoodan Movement

- The Bhoodan Movement grew in a village known as Bhoodan Pochampally in Telangana.
- The Bhoodan Movement (Land Gift Movement) attempted to persuade wealthy landowners to voluntarily give a percentage of their land to landless people.
- It is also known as the Bloodless Revolution was a voluntary land reform movement in India.

How were Vinoba Bhave and Mahatma Gandhi related?

- Attracted towards the principles and ideologies of Mahatma Gandhi and considered Gandhi his guru Mahatma Gandhi in 1916, from both political and spiritual point of view.
- Abandoned his high school studies in 1916 to join Gandhi's ashram (ascetic community) at Sabarmati, near Ahmedabad.
- Gandhi's teachings led Bhave to a life of austerity dedicated to improving Indian village life.
- Bhave played an important role in the Quit India Movement.
- In 1940, he was chosen as the first Individual Satyagrahi (an Individual standing up for Truth instead of a collective action) against British Raj by Gandhi in India.
- After this event, the unknown Vinoba Bhave became known to the whole country.

21st SCO SUMMIT HELD IN DUSHANBE, TAJIKISTAN

⊙ CONTEXT:

The 21st Shanghai Cooperation Organisation (SCO) summit at **Dushanbe, Tajikistan** held recently via video Conferencing. Discussions took place on two critical issues:

- Membership of Iran to this organisation
- the unfolding security situation in Afghanistan

What is Shanghai Cooperation Organisation (SCO)?

- The SCO is a **permanent international intergovernmental organization.**
- It was founded at a summit in Shanghai in 2001 by the Presidents of Russia, China, the Kyrgyz Republic, Kazakhstan, Tajikistan and Uzbekistan.
- The Shanghai Cooperation Organisation Charter was signed during the St. Petersburg SCO Heads of State meeting in June 2002, and entered into force on 19 September 2003.

Members countries of SCO		
8 Member States	**4 Observer States**	**6 Dialogue Partners**
China India Kazakhstan Kyrgyzstan Russia Pakistan Tajikistan Uzbekistan	Afghanistan Belarus Iran Mongolia	Armenia Azerbaijan Cambodia Nepal Sri Lanka Turkey

India & SCO

- India was made an **Observer** at the SCO in 2005.
- The historical meeting of the Heads of State Council of the **Shanghai Cooperation Organisation** was held in 2017 in **Astana**.
- At the meeting the status of a full member of the Organization was granted to the **Republic of India** and t**he Islamic Republic of Pakistan.**

Key- highlights of the summit

- The summit is important as it is taking place at a time when Taliban has taken over Afghanistan and has declared formation of an Interim government, after the US led forces left that country after two decades.
  - This has led to the fear that there will be an increase in drug trafficking, terror groups operating from Afghanistan.
- The main focus of this summit was primarily on the ground situation in Afghanistan and its global repercussions.
- The SCO Summit was followed by an Outreach session on Afghanistan between SCO and the **Collective Security Treaty Organisation (CSTO).**
  - Afghanistan has had an observer status in the SCO.
- Members of the China and Russia-led Shanghai Cooperation Organisation endorsed Iran's future membership of the bloc that already includes South Asian rivals India and Pakistan.

India's stand in the 21st SCO's summit

The Indian delegation, led by Prime Minister Narendra Modi, urged the eight-member panel to come up with a **joint approach** and frame a **code of conduct** to stop terror financing and cross-border terrorism.

- PM Modi flagged concerns over the serious humanitarian crisis unfolding in Afghanistan, noting that the economic woes of the Afghan people are increasing due to the blockage in financial and trade flows.
- PM Modi said the recent developments in Afghanistan will have the greatest impact on neighbouring countries like India and added that there was a need for regional focus and cooperation on the situation in the country.
- He pointed out that the developments in the country could lead to an uncontrolled flow of drugs, illegal weapons and human trafficking.
- Modi warned that continued **instability and fundamentalism** in Afghanistan would encourage terrorist and extremist ideologies all over the world.
- India is committed to increasing its connectivity with **Central Asia.** Asserting that there should be respect for the territorial integrity of all countries.

WORLD BANK TO STOP 'EASE OF DOING BUSINESS' REPORT

⊙ CONTEXT: **World Bank to stop its famous and fought-over 'ease of doing business' report after an internal audit found "undue pressure" by top bank officials to manipulate data had resulted in country rankings changed to favour China.**

What is Ease of Doing Business Index?

- The Ease of Doing Business (EoDB) index is a ranking system established by the **World Bank Group.**
- **Published by**: World Bank
- It is an aggregate figure that includes different parameters which define the ease of doing business in a country.
- **Indicators:** The quantitative indicators ranged from
  - dealing with construction permits
  - getting electricity
  - getting credit
  - protecting minority investors
  - paying taxes
  - trading across borders
- However, it does not directly measure more general conditions such as a nation's proximity to large markets, quality of infrastructure, inflation, or crime.
- **Ranking:** ranges from 1 to 190.
- The rankings on the Ease of Doing Business Report help in assessing the "absolute level of regulatory performance over time".
- The 2020 report was the 17th in the series of annual studies.

CRITICALLY-ENDANGERED ORIENTAL WHITE-BACKED VULTURES FLY TOWARDS SURVIVAL FROM HARYANA

⊙ CONTEXT: **Eight critically endangered Oriental white-backed vultures were released into the wild for the first time in India from the Jatayu Conservation and Breeding Centre (JCBC).**

- A year later, they have blended well into the untamed habitat outside the aviary, offering hope to conservationists. But the grave threats to the survival of vultures are far from over.

Background

- **Released in:** October 2020
- **Location:** Jatayu Conservation and Breeding Centre (JCBC) situated at the Bir Shikargah Wildlife Sanctuary in Shivalik ranges of the Himalayan foothills, Haryana's Pinjore
- All eight vultures were deployed with satellite tracking devices on their back, and orange-coloured wing tags on both wings to monitor them.
- They have been bred in captivity so they will gradually adjust in the wild.
- Also, they have managed to join the wild flock with other vultures such as the Himalayan griffon, which is surely an encouraging sign.

Jatayu conservation breeding centre (JCBC)

- About Jatayu Conservation and Breeding Centre: It is the first Vulture breeding facility in Asia.
  - ➤ JCBC was established near Pinjore in 2004. Since then, the centre has successfully released its one pair of Himalayan Griffon vultures in 2016.
- Location: Jatayu conservation breeding centre (JCBC) for vultures is situated just outside Bir Shikargah Wildlife Sanctuary in Morni hills of the Shivalik ranges around 8km from the city of Pinjore off the busy Chandigarh-Shimla highway. It is situated within BirShikargah Wildlife in the town of Pinjore of Panchkula district, Haryana.
- Purpose: It was established for the breeding and conservation of Indian vultures and House sparrows.
- Implementing Organizations: JCBC is run by the Forests Department, Haryana and Bombay Natural History Society (BNHS) with the help of the British charity Royal Society for the Protection of Birds (RSPB).
- Jatayu Conservation and Breeding Centre hosts and works towards breeding four environmentally threatened species. Their respective threatened status in the IUCN red data book is as follows–
  - ➤ Indian vulture (also known as long-billed Vultures)- Critically Endangered
  - ➤ Slender-billed vultures- Critically Endangered
  - ➤ Himalayan Vultures (also known as Himalayan griffon vultures) – Near Threatened
  - ➤ Oriental white-backed vultures– Critically Endangered

About the Vulture

- The Oriental white-backed vultures that were released in the wild are resident birds and not migratory, so they largely stay within a radius of 50-100 km of the breeding center.

- It is an Old World vulture in the family Accipitridae, which also includes eagles, kites, buzzards and hawks.
- It is closely related to the European Griffon Vulture, *G. fulvus*.

Declining Vulture Population

- Once very common, vultures are on the verge of extinction in India.
- The vulture population in India was estimated at 40 million once.
- Populations of three species of vultures — the Oriental white-backed vulture, the Long-billed vulture and the Slender-billed vulture — have declined by over 97% since the 1990s, and that of the Oriental white-backed vultures by a drastic 99.9%.

Threats

- Uncontrolled veterinary usage of non-steroidal anti-inflammatory drugs (NSAID), including Aceclofenac, Ketoprofen and Nimesulide.
- Illegal use of the banned drug Diclofenac, are toxic to vultures if they feed on carcasses within 72 hours of the drugs' administration to such livestock.

GENE BEHIND SIMILIPAL TIGER RESERVE'S MELANISTIC TIGERS DECODED

⊙ CONTEXT: **A group of researchers has discovered the genetic mutation that caused pseudomelanism in a limited number of tigers found only in the fourth largest tiger habitat in the country.**

The rare Black Tiger

- The rare tigers were first officially discovered in STR in 2007. Since then it has been a mystery.
- These Odisha tigers essentially have stripes that are larger than found in other tigers.
- And, these stripes merge among one another, causing the tigers to appear as though they have black-coloured skin.

> According to the 2018 tiger census, India has an estimated 2,967 tigers. of which 8 are known to be staying within the 2,750 sq km Odisha park, whereas another 12 were using the tiger reserve.

Key-findings

- They found the black tigers are mutants and are Bengal tigers with a single base mutation in the gene Transmembrane Aminopeptidase Q (Taqpep).
- Different mutations in this gene are known to cause similar changes in coat colour in several other species of cats, including cheetahs.
- The drastic change in patterning and colouring of the black tiger's coat is caused by just one change in the genetic material DNA Alphabet from C (Cytosine) to T (Thymine) in position 1360 of the Taqpep gene sequence.
- Further genetic analyses and comparisons with a total of 395 captive and wild Indian tiger populations indicates that the mutation in Similipal tigers is very rare.
- The only other black tigers outside of Similipal in India exist at the
  - **Nandankanan Biological Park,** Bhubaneswar
  - **Arignar Anna Zoological Park,** Chennai

- **Bhagwan Birsa Biological Park,** Ranchi

- Genetic tracing proved that these captive-born tigers shared a common ancestry with Similipal tigers.

Simlipal National Park

- Simlipal National Park is a national park and a tiger reserve in the Mayurbhanj district in the Indian state of Odisha
- Simplipal was designated a tiger reserve in 1956 and in May 1973 the essential part of the Project Tiger in May 1973.

Since 2009, it has been part of the UNESCO World Network of Biosphere Reserve.

GLOBAL METHANE PLEDGE

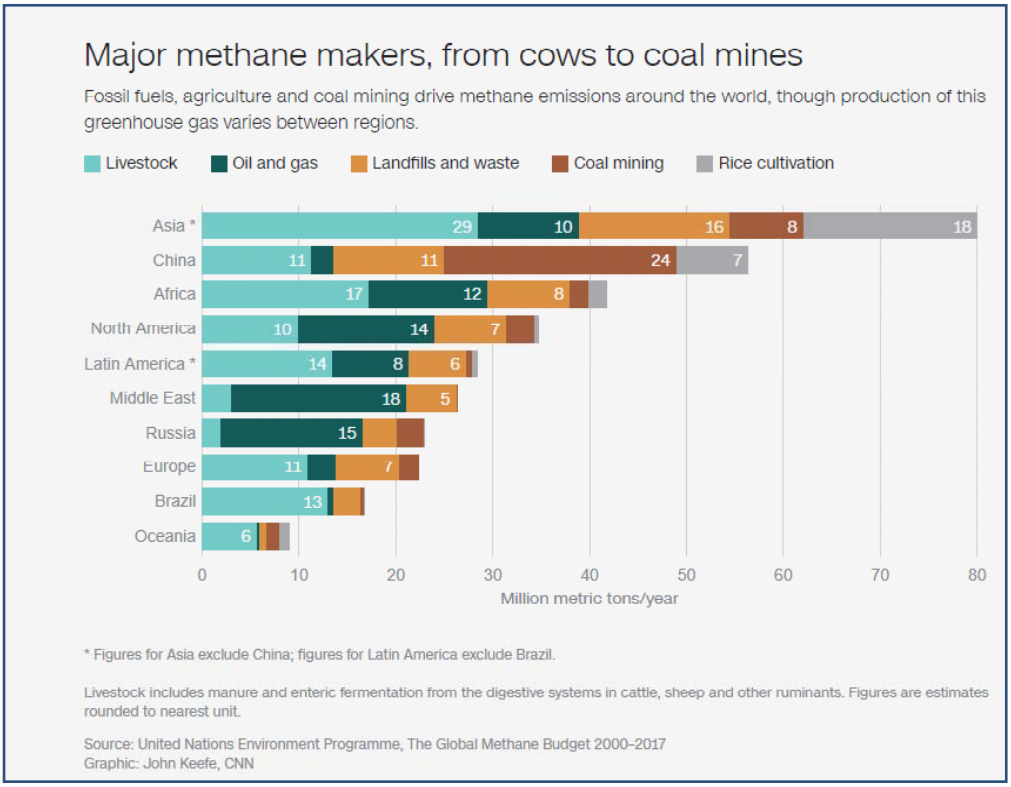
CONTEXT: **The US and the EU made a joint pledge to cut global methane emissions by almost a third in the next decade.**

Key-highlights of the Pact

- The pact between the US and the EU sets a target of cutting at least 30% from global methane emissions, based on 2020 levels, by 2030.
- If adopted around the world, this would reduce global heating by 0.2C by the 2040s, compared with likely temperature rises by then.
- The world is now about 1.2C hotter now than in pre-industrial times.

Steps taken by India to reduce emissions

- India has announced a renewable energy capacity goal of 450 GW by 2030.
- Indian Railways has committed to achieving 'net zero' emissions by that year.



- However, India as a whole has not committed to a time frame for reaching that target.
- Some 130 countries are considering a net zero emissions target by 2050.

About Methane

- Methane is a potent greenhouse gas.
- It is about 80 times more effective at trapping heat in the atmosphere than carbon dioxide.
- Natural gas production and fracking, meat production and other forms of agriculture are among the chief sources.

PGSIT: TECH BASED ON CRISPR TO CONTROL GROWTH OF MOSQUITOES

CONTEXT: **CRISPR-based genetic engineering researchers have created a "precision-guided sterile insect technique" (pgSIT), a system that restrains populations of mosquitoes that infect millions each year with debilitating diseases.**

What is Precision-guided sterile insect technique (pgSIT)?

- It is a new scalable genetic control system that uses a **CRISPR-based approach** to engineer deployable mosquitoes that can suppress populations.
  - Males don't transmit diseases so the idea is to release more and more sterile males.
- The precision-guided sterile insect technique alters genes linked to male fertility and female flight in **Aedes aegypti.**
  - **Aedes aegypti** is the species responsible for spreading diseases including dengue fever, chikungunya and Zika.
- The envisioned pgSIT system could be implemented by deploying eggs of sterile males and flightless females at target locations where mosquito-borne disease spread is occurring.
- The system is self-limiting and is not predicted to persist or spread in the environment.
- Once the pgSIT eggs are released in the wild, sterile pgSIT males will emerge and eventually mate with females, driving down the wild population as needed.

Clustered regularly interspaced short palindromic repeats (CRISPR)

- It is a gene editing technology.
- It replicates natural defence mechanisms in bacteria to fight virus attacks, using a special protein called Cas9.
- CRISPR-Cas9 technology behaves like a cut-and-paste mechanism on DNA strands that contain genetic information.
- The specific location of the genetic codes that need to be changed, or edited, is identified on the DNA strand, and then, using the Cas9 protein, which acts like a pair of scissors, that location is cut off from the strand.

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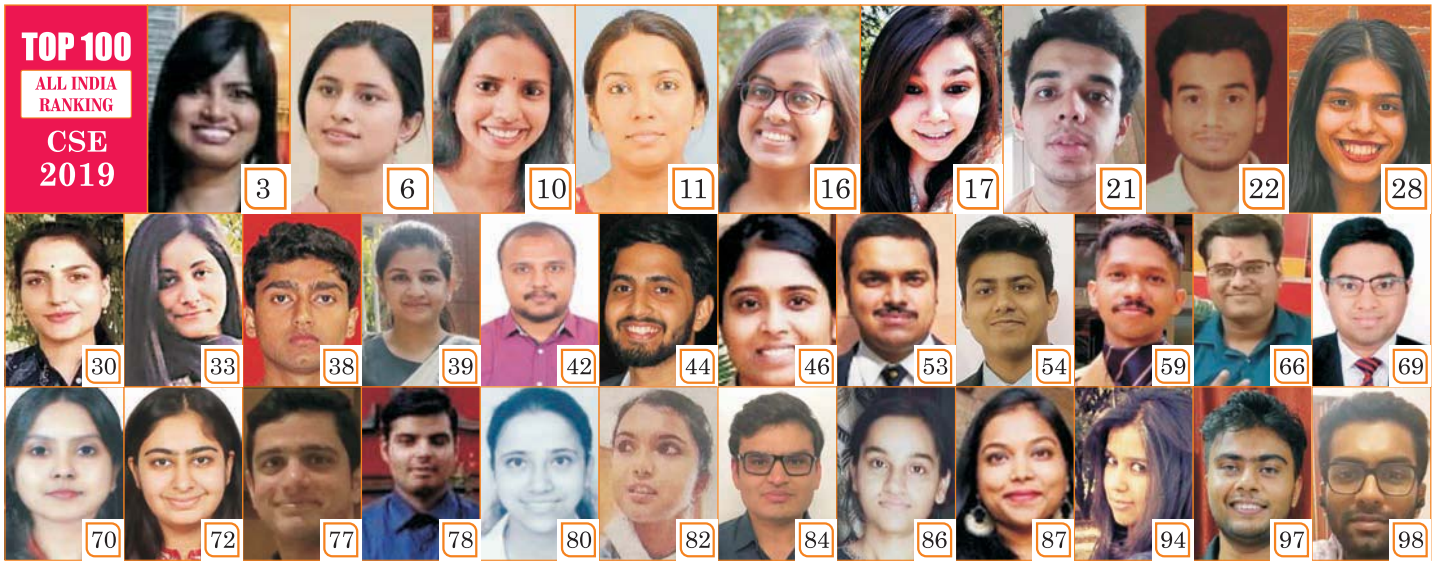
CSE RESULTS

TOP 100 ALL INDIA RANKING CSE 2019



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TOP 100 ALL INDIA RANKING CSE 2018

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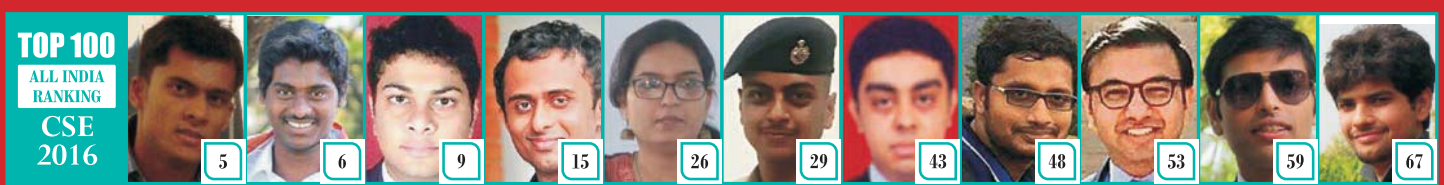

TOP 100 ALL INDIA RANKING CSE 2015