2023

- Union Budget
- AISHE
- Vibrant Village Programme
- U-Win Portal
- Sickel Cell Disease

TNPSC தேர்வுகளில் வெற்றி பெறுவதற்கான *முக்கிய ஆலோசனைகள்...*

1. தேர்வுகளில் வெற்றி பெறுவதற்காக சாத்தியமாகக் கூடிய கால அட்டவணையை முதலில் தயாரித்து, அதை உறுதியாகப் பின்பற்ற வேண்டும்.

2. TNPSC தேர்வுக்கான பாடத்திட்டம் என்ன என்பதை முழுமையாக அறிந்துகொண்டு, அதில் எந்தப் பகுதியையும் விடாமல் படிக்க வேண்டும்.

3. முதன்மை ஆதாரங்கள் அல்லது நூல்களில் இருந்து தரமான குறிப்புகளைத் தயாரித்து வைத்துக்கொள்ள வேண்டும்.

4. TNPSC தேர்வு எழுதுவதற்கான அறிவுத் திறனை அடுத்த நிலைக்கு மேம்படுத்த எஸ்.சி.இ.ஆர்.டி (SCERT) எனப்படும் மாநிலக் கல்வியல் ஆராய்ச்சி மற்றும் பயிற்சி நிறுவனக்குழு தயாரிக்கும் பாட நூல்களில் இருந்து அவற்றின் அடிப்படைத் தத்துவத்தை புரிந்துகொள்ள வேண்டியது மிகவும் முக்கியமாகும்.

5. பாடங்களில் இருந்து எவ்வாறு வினாக்கள் எழுப்பப்படும் என்பதை அறிந்து கொள்வதற்காக அவற்றின் தத்துவங்கள், உண்மைகள் போன்றவற்றை தேர்வுக்கானக் கோணத்தில் இருந்து புரிந்துகொள்ள வேண்டும்.

6. முந்தைய ஆண்டின் வினாக்களை நன்றாகப் படித்து, அவற்றை ஆய்வு செய்ய வேண்டும்.

7. அத்தியாயங்கள் வாரியாகவும், பாடங்கள் வாரியாகவும் பயிற்சித் தேர்வுகளை எழுதிப் பார்க்க வேண்டும். அவ்வாறு செய்வதன் மூலம் உண்மையான தேர்வு எவ்வாறு இருக்கும் என்பது குறித்த அனுபவம் நமக்குக் கிடைப்பதுடன், தவறுகளைத் திருத்திக் கொண்டு மேம்படுத்திக் கொள்ளவும் முடியும்.

8. கடந்த ஆண்டுக்கான பொது அறிவு வினாத்தாள்களுக்கு விடை அளிக்க முயற்சி செய்ய வேண்டும். உங்களின் பலவீனம் என்ன என்பதை தெரிந்து கொள்ள அது உதவும். நீங்கள் எந்த அளவிற்குத் தேர்வுக்கு தயாராகி இருக்கிறீர்கள்? உங்களின் அறிவுத் திறன், விடை அளிக்கும் வேகம், துல்லியம் ஆகியவற்றை அளவிடுவதற்கும் இது உதவும்.

9. பாடங்களை ஒருமுறையாவது திருப்புதல் செய்து பார்ப்பது கட்டாயம் ஆகும்.

10. அனைத்துப் பாடங்களையும் ஒருமுறை திருப்புதல் செய்து பார்ப்பதும், தயார் செய்து வைக்கப்பட்டுள்ள குறிப்புகளை மூன்றாவது முறையில் படித்துப் பார்ப்பதும் சிறப்பாகும்.

11. தேர்வுக்கு முந்தைய ஒரு மாதத்தில் புதிய பாடங்களைப் படித்து ஆராய ஒருபோதும் முயற்சி செய்ய வேண்டாம். அந்த ஒரு மாதமும் ஏற்கனவே படித்த பாடங்களை திருப்புதல் செய்து பார்ப்பதற்கு மட்டுமே ஒதுக்கப்பட வேண்டும். அந்த ஒரு மாதம் முழுவதும் திருப்புதல், திருப்புதல், திருப்புதல் என்பதே மந்திரமாக இருக்க வேண்டும்.

12. செய்திகளையும், நாட்டு நடப்புகளையும் தொடர்ச்சியாகப் படித்து வரவேண்டும். பாடங்களையும், தேசிய மற்றும் சர்வதேச நிகழ்வுகளையும் நன்கு அறிந்துகொள்ள வேண்டும்.

13. அடுத்த நாள் தேர்வு நடக்க இருப்பதாகக் கருதிக் கொண்டு அதற்கேற்ற வகையில் தேர்வுக்குத் தயாராகுவதற்கான உத்தி வகுக்கப்பட வேண்டும். அந்த அளவுக்கான தயாரிப்பு அவசியமாகும்.

14. ஒவ்வொரு நாளும் உறங்கச் செல்வதற்கு முன் அந்த நாள் முழுவதும் படித்த பாடங்களை ஒருமுறை நினைவுபடுத்திக் கொள்ள வேண்டும். அது உங்களின் நினைவுத் திறனை வலுப்படுத்தும்.

15. முதல்நிலைத் தேர்வுக்கான பொது அறிவு முதல் தாளுக்கான தயாரிப்பு முதன்மைத் தேர்வையும் மனதில் கொண்டு தொடரப்பட வேண்டும்.

SURESH' 360°

Competitive Exam Monthly Magazine

INDEX

VII. Welfare Oriented Schemes and their Utility, Problem in Public Delivery System (Central Government & State Government)

1. Central Government

2. State Government

VIII. Geography – Geographical marks

IX. Environment

X. Economy – Economy, Socio-Economic issue

1. Economy

2. Socio Economic Issue

XI. Science and Technology

XII. Miscellaneous

I. Profile of State

NAGALAND

ABOUT

- The state of Nagaland was formally inaugurated on December 1st, 1963, As the 16th State of the Indian Union.

- It is bounded by Assam in the West, Myanmar (Burma) on the east, Arunachal Pradesh and part of Assam on the North and Manipur in the South.

Distinct features about Nagaland

- The State consists of 16 (Sixteen) Administrative Districts, inhabited by 17 major tribes along with other sub-tribes. Each tribe is distinct in charac-

ter from the other in terms of customs, language and dress.
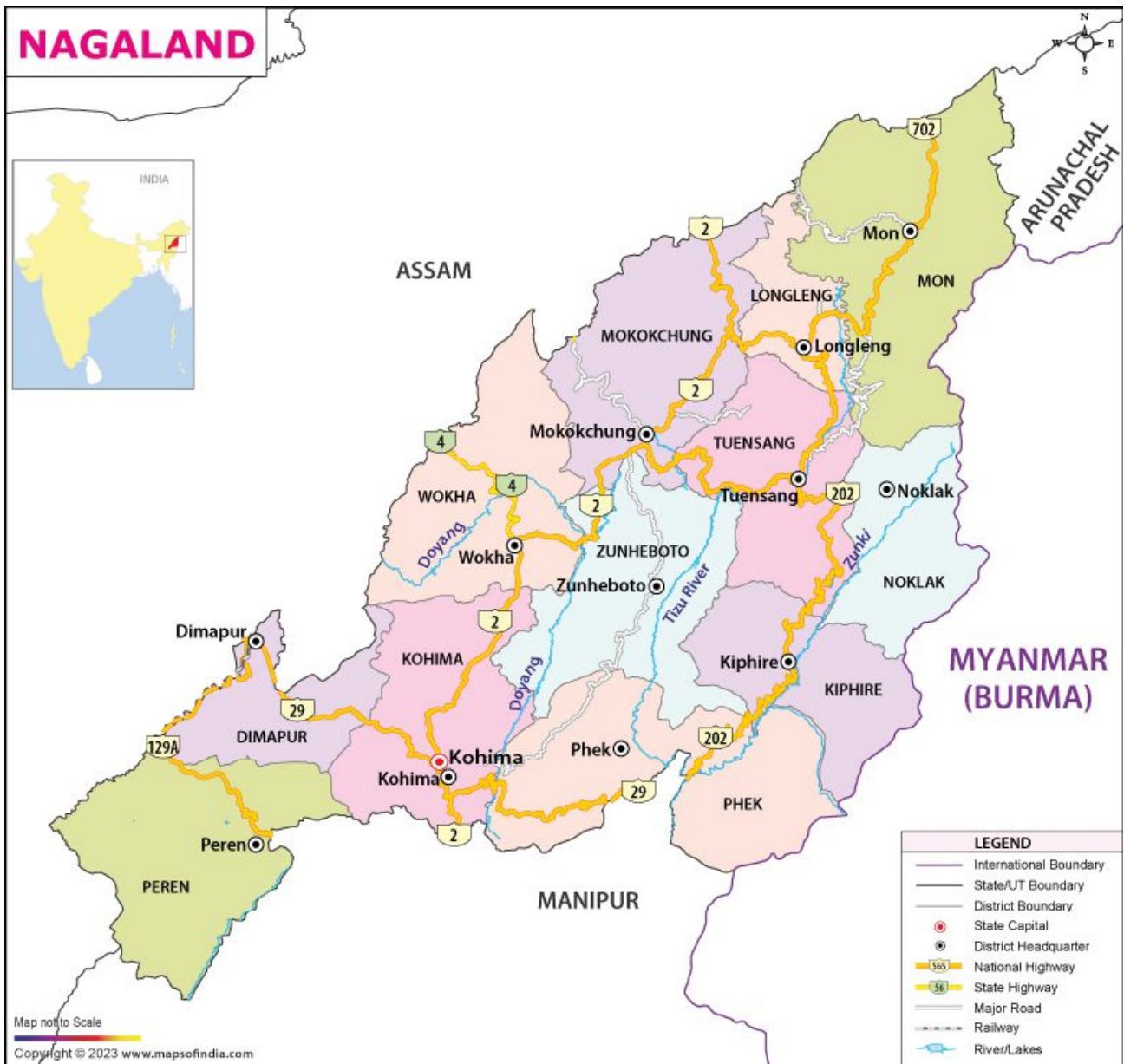
- It is a land of folklore passed down the generations through word of mouth.

- Here, music is an integral part of life; folk songs eulogising ancestors, the brave deeds of warriors and traditional heroes; poetic love songs immortalising ancient tragic love stories; Gospel songs that touch your soul (should you have a religious bend of mind) or the modern tunes rendered exquisitely to set your feet a-tapping.

ABOUT NAGA TRIBES

- Each of the 17 odd tribes and sub-tribes that Dwell in this exotic hill state can easily be distinguished by the colourful and intricately designed costumes, jewellery and beads that they Adorn.

- The present generation of Nagas has ventured into fashion designing in a big way, reproducing fabrics that represent the ancestral motifs blended with modern appeal.

- Indeed, it is a beautiful mix of the past with the present, a paradise for those who are into fashion designing.

- This is an affluent fashion station of the East.

- The traditional ceremonial attire of each tribe is in itself, an awe inspiring sight to behold; the multicolored spears and daos decorated with dyed goat's hair, the headgear made of fine-

ly woven bamboo interlaced with orchid stems, adorned with boar's teeth and hornbill's feathers, elephant tusk armlets.

- In days of yore every warrior had to earn each of these items through acts of valour, to wear them.

Nagaland as the Switzerland of East

- Nature could not have been kinder to Nagaland, sometimes referred to as the Switzerland of the East; the exquisitely picturesque landscapes, the vibrantly colorful sunrise and sunset, lush and verdant flora, this is a land that represents unimaginable beauty, moulded perfectly for a breath taking experience.

- Its people belong to the Indo-Mongoloid stock, whose ancestors lived off nature's abundant gifts, blessed with sturdy formidable dispositions.

- Above all, the people here are warmhearted and extremely hospitable.

- Nagaland is blessed with salubrious climate throughout the year and one can visit it anytime.

- If one is looking for a quiet getaway, from the hustle and bustle of city life, it provides the right ambience; as life here is laidback and slow - providing a tension free life.

- For the adventurous and the intrepid, Nagaland is an ideal place for trekking, rock climbing, jungle camping and offers limitless exploration possi-

bilities in its lush and verdant sub-tropical rain forests which are also a treasure trove of a plethora of medicinal plants.

Linguistic Tradition of Nagaland

- What is even more remarkable is that even within the language of a particular tribe, there are dialects mutually unintelligible.

- For instance, in some tribes like the Angami, every village has a slightly different variation even within the same dialect-this variance progressively increasing with the geographical distance.

- This makes inter-tribe and intra-tribe communication very difficult.

- In the circumstances, English has come to serve as the State language while Nagamese, a kind of pidgin Assamese, has become the common lingua

Land of Festival

- Nagaland is a land of Festivals. All the tribes celebrate their distinct seasonal festivals with a Pageantry of colour and a feast of music.

- Nagaland has a rich linguistic tradition with as many languages as there are tribes, each exclusive to itself.

Seasonal festivals of Naga Tribes

- All the tribes have their own festivals which they hold so dear.

- They regard their festivals sacrosanct and participation in celebration is compulsory.

- They celebrate their distinct seasonal festivals with a Pageantry of colour and a feast of Music.
- Most of these festivals revolve round agriculture, it being the main-stay of Naga society.
- Over 85% population of Nagaland is directly dependent on agriculture and lives in a thousand and odd villages situated on high hill tops or slopes overlooking verdant valleys humming with murmuring streams.
- In this blissful setting Nagas enjoy the blessing of Nature with rare gusto striking the onlookers with awe and admiration. In most of the places agriculture consists of monocrop.
- Although some religious and spiritual sentiments are inter woven into secular rites and rituals, the pre- dominant theme of the festivals is offering of prayers to a Supreme Being having different names in different Naga dialects.
- At these festivals, the spirit of Gods is propitiated with sacrifices by the Village Shaman for a bountiful harvest either before the sowing or on the eve of harvest.
- The State is replete with festivities throughout the year, as all tribes celebrate their own festivals with a pageantry of colour, music and dance.
- A common feature is that the festivals revolve around agriculture, the mainstay of Naga economy. These festivals hark back to times

prior to the advent of Christianity.

About Orange Festival in Nagaland

- The third edition of the two-day Orange Festival has been organized in Nagaland's Rusoma village to mark the harvest of organic oranges in the district.
- The orange festival was held from 24th to 25th January 2023. The orange festival is held to display the harvested oranges from the village.

Key Points

- The Orange Festival was inaugurated by K. NeibuSekhose, the Additional Director of the Department of Rural Development in Nagaland.
- The Rusoma village is situated about 8 kilometers from the state's capital and cultivates pure organic oranges.
- K. NeibuSekhose, informed that the orange harvest was less this year owing to the change in Climate conditions.
- The Rusoma village is blessed with fertile soil, and it is best for the cultivation of oranges.

- Around 70 hectares of land owned by 50 families are being used for the cultivation of organic oranges.
- The village generates an annual income of over 40 lakhs. A single orange tree bears 4000 to 5000 fruits.
- The local farmers have informed us that the orange plantation is not an easy venture and needs lots of hard work and dedication.

- Area : 16,579 square kilometres (6,401 sq mi)
- Population : 1,980,602 per the 2011 Census of India
- Tribes : Angami, Ao, Chakhesang, Chang, Dimasa Kachari, Khiamniungan, Konyak, Kuki, Lotha, Phom, Pochury, Rengma, Sangtam, Sumi, Tikhir, Yimkhiung, Zeliang
- Districts : Chümoukedima, Dimapur, Kiphire, Kohima, Longleng, Mokokchung, Mon, Niuland, Noklak, Peren, Phek, Shamator, Tseminyu, Tuensang, Wokha, Zunheboto

II. National Symbol

- Mango is India's national fruit. Indians have traditionally regarded ripe meaty mangoes as the King of all fruits, and they are undoubtedly delicious.

- The uncooked ones are great for making spicy pickles, which are a staple in Indian cuisine. Mangoes are the most cultivated tropical fruits and belong to the Mangifera indica species.

- They are native to India and belong to the Mangifera indica species.

- India has over 100 varieties of luscious mangoes in green, orange, yellow, and red tints, all of which are high in Vitamins A, C, and D.

- They come in a variety of sizes and forms. Historians have written about how tasty this savoury fruit was in ancient times.

- Mangoes have been praised by the famous Indian poet Kalidasa, and historians claim that the great Alexander and the famous Chinese traveller have tasted its wonderful flavour.

Mango

- Mangoes have been praised by the famous Indian poet Kalidasa, and historians claim that the great Alexander and the famous Chinese traveller have tasted its wonderful flavour. In Lakhi Bagh in Darbhanga, Bihar, the famous Moghul monarch Akabar is said to have planted 100,000 mango trees.

- Every year, the International Mango Festival, India's National Fruit, is held in Delhi, showcasing a wide selection of traditionally popular Indian varieties as well as the most recent discoveries of mango kinds that are sweet, healthful, and quick to bear fruit. It allows visitors to sample the many mango flavours, purchase a tree for their fruit garden, and learn about mango cultivation. This summer fruit may or may not have one huge, non-edible seed that can be used to make various medications.

Significance of the National Fruit of India

- Mango (Mangifera indica), often known as the King of Fruits, is India's national fruit. Since time immemorial, its sweet scent and exquisite flavours have captured the hearts of countless people all over the world. As India's national fruit, it represents prosperity, abundance, and wealth in the country's image.

The leading producers of mangoes are India

- Mangoes are farmed all over the world, however, there are only a few nations that produce mango purée and/or juice for export.

- India produces over 20 million tonnes of mango each year, making it the world's largest producer.

- This figure was approximately 10-11 million tonnes ten years ago, but India's mango production has constantly climbed.

- The fresh market accounts for the vast majority of India's output. Mango is a fresh fruit that cannot be stored for long periods of time, unlike apples, and while it can be grown for most of the year, the new season fruit is anxiously sought midway through the year, depending on geography.

- In terms of processing, India does some value additions, but

most of the processing is for chutneys and pickles, which are popular both domestically and internationally.

- The United Kingdom is the country's largest customer, consuming roughly 16,000 tonnes each year.
- Frozen mango is also exported for use in pickle production in other parts of the world; for example, the Patak brand manufactures products in the United Kingdom.

- Apart from this season, India's fresh mango distribution is well-organized, and the country still only processes approximately 7% of its fruit into juices and single-strength or concentrated purées.
- The country has a completed product manufacturing capability of roughly 700,000 tonnes, while actual output is around 450,000-500,000 tonnes per year.

Mango, India's national fruit

- Apart from this season, India's fresh mango distribution is well-organized, and the country still only processes approximately 7% of its fruit into juices and single-strength or concentrated purées.
- The country has a completed product manufacturing capability of roughly 700,000 tonnes, while actual output is around 450,000-500,000 tonnes per year.

III. EMINENT PERSONS AND PLACES, SPORTS, BOOK AUTHORS

1. EMINENT PERSONS

Balkrishna Vithaldas Doshi (1927-2023)

- Indian architect BV Doshi has passed away, at the age of 95, in Ahmedabad, Gujarat.
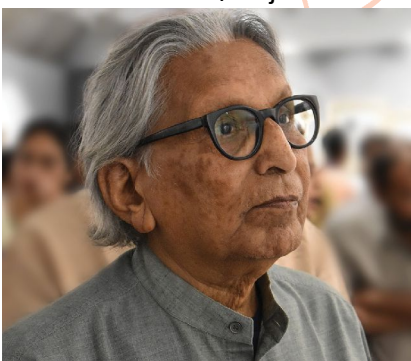
- Trained under Le Corbusier, he was the only Indian to have been awarded the Pritzker Architecture Prize.
- He was a Pioneer of Indian modernist architecture.

- He won the gold medal awarded by the Royal Institute of British Architects in 2022.
- Doshi was known for designing the buildings of the Ahmedabad-based Centre for Environment and Planning Technology (CEPT) and Mahatma Gandhi Labour Institute.

Iron Man of India

- Sabir Ali, known as the "Ironman of India," passed away recently.
- He won the decathlon gold medal at the Asian Athletics Championships in Tokyo in 1981.
- He also won two silver medals at the South Asian Federation Games held in Kathmandu and Dhaka.

- Ali won eight consecutive Open National titles in the gruelling event between 1979 and 1985.
- Ali won a bronze and silver at the World Railway meets in 1981 and 1985.
- He was honoured with the Arjuna Award in 1981.
- During those days, Daley Thompson was known as the 'Ironman of Olympics', Sabir was known as the 'Ironman of India'

R VISHNU PRASAD

- R Vishnu Prasad was awarded "The most distinguished scientist of the year 2022".

- He is a scientist with 69 patents.

- The award, which recognizes individuals for their outstanding contributions in various fields, including culture, science, sports, and innovation.

- Dr. Prasad has published over 300 research papers in international journals, and has been awarded several patents for his inventions.

- He has also received several prestigious awards, including the Shanti Swarup Bhatnagar Prize, India's highest award for contributions to science and technology.

Former Law Minister Shanti Bhushan

- Former Union law minister and eminent jurist Shanti Bhushan passed away recently.

- He represented politician Raj Narain in the historic case that led to the annulment of the then prime minister Indira Gandhi's election in 1975.

- In the historic Raj Narain vs Indira Nehru Gandhi case, the Allahabad High Court in June 1975 had disqualified Gandhi for a period of six years from contesting elections.

- Bhushan served as the law minister from 1977 to 1979 in the Morarji Desai cabinet.

- As the law minister, he introduced Forty-fourth Amendment of the Constitution in 1978.

World's brightest" students

- Natasha Perianayagam, a 13-year-old Indian-American schoolgirl, has been named on the "world's brightest" students list for the second year in a row by the Johns Hopkins Center For Talented Youth

Values to learn from her life:

- Hard Work

- Diversity and Inclusion (She was one of 15,300 students from 76 countries)

- Balance (Despite her academic achievements, Natasha still finds time to engage in hobbies such as doodling and reading, demonstrating the importance of finding a balance between work and leisure)

Kanak Rele

- Context: Classical dance legend Kanak Rele and the Mohini-yattam exponent passed away

Her achievements:

- She was known as one of India's most inventive classical dancers and pioneering dance educationists

- She brought a systematic structure, academic veracity and much currency to Mohiniyattam

- She propagated female roles in Kathakali

- In 1977, she earned her PhD in dance, the first in India

- She was awarded the first Guru Gopinath National Puraskaram by the Government of Kerala

- She was awarded various awards including Padma Shri (1989), Sangeet Natak Akademi Award (1994), M. S. Subbulakshmi Award, Kalidas Samman (2006), & Padma Bhushan (2013)

Mohiniyattam: Kanak Rele

Context: Classical dance legend Kanak Rele and the Mohiniyattam exponent passed away

About
Kanak Rele (1937 – 2023) was an Indian dancer, choreographer, and academician best known as an exponent of Mohiniyattam.

About Mohiniyattam:
Name: Dance of Mohini (a form of Lord Vishnu)
Theme: Story of dance of Vishnu in Mohini form

Features:
- **Performed by Women** (mostly solo)
- **Gentle footwork** (no thumping of footsteps)
- **Beauty and grace** is dominant (Lasya aspect)
- **Integrates some elements of Bharatnatyam** (grace) and **Kathakali** (vigor)
- **Revived by V N Menon and Kalyani Amma**
- **Costume**: Kasavu Saree (white colored with gold brocade) and Ghungroo

Dr. Kanak Rele

The Sangeet Natak Academy recognizes eight classical dance in India– Bharatanatyam, Kathak, Kuchipudi, Odissi, Kathakali, Sattriya, Manipuri and Mohiniyattam

2. Sports

ICC annual awards 2022

- The International Cricket Council (ICC) has announced its first individual award winners in the ICC Awards 2022.

- Winners in the 13 individual categories were based on overall performances & achievements throughout the calendar year

Category	Winner
Sir Garfield Sobers Trophy	Babar Azam (Pakistan)
Rachael Heyhoe Flint Trophy	Nat Sciver (England)
Men's Test Cricketer of the Year:	Ben Stokes (England)
Men's ODI Cricketer of the Year:	Babar Azam
Women's ODI Cricketer of the Year:	Nat Sciver
Men's T20 International Cricketer of the Year	Suryakumar Yadav (India)
Women's T20 International Cricketer of the Year	Tahlia McGrath (Australia)
Men's Emerging Cricketer of the Year:	Marco Jansen (South Africa)
Women's Emerging Cricketer of the Year	Renuka Singh (India)
Men's Associate Cricketer of the Year:	Gerhard Erasmus (Namibia)
Women's Associate Cricketer of the Year	Esha Oza (India)
David Shepherd Trophy	Richard Illingworth (England)
Spirit of Cricket Award	Aasif Sheikh (Nepal).

National Ice Hockey Championship

- The 12th edition of the Ice Hockey Association of India (IHAI) National Ice Hockey Championship for men - 2023 organized in Leh, Ladakh.

- ITBP wins the Championship for the third consecutive time

- The ITBP is a pioneer in the adventure sports in the country

- And it possesses an unparalleled record of mountaineering and allied sports in the country

Formula E

- Context: Hyderabad will host the first-ever E-Prix race that will take place on India's first street circuit (located near the shores of Hussain Sagar Lake).

What is Formula E?

- Formula E is an electric equivalent of the widely followed Formula 1 which was staged in India from 2011 to 2013.

- However, other than the 'Formula' prefix, there is no similarity between the two FIA world championship status events.

- Hyderabad has become the 30th location to host a Formula E race

- It is the first global sport to be certified with a net zero carbon footprint

Unique feature:

- Gen3 technology has been introduced this season. Gen3 is the fastest, lightest, most powerful and most efficient car in its history.

- More than 40 per cent of the energy in the Gen3 will come from regenerative braking (energy recovery mechanism that slows down a moving vehicle)

India's first frozen-lake marathon

- India's first "frozen-lake marathon" held at Ladakh's Pangong Tso lake.

- The 21-kilometre marathon, with Lukung as its starting point, will end at Maan village.

- Seventy-five selected athletes from India and abroad are participating in the run.

- It was giving them an opportunity to make a bid for a Guinness world record for the world's highest "frozen-lake marathon."

Sania Mirza

Sania Mirza, the Indian tennis player, retired from professional tennis at the age of 36, ending a 20-year-long career.

Her Achievements: Sania has represented India at an elite level, winning six doubles Grand Slam titles, spending 91 weeks as the doubles World No. 1

"Want to tell young women, don't let anybody tell you that you can't do what you want"

Lessons from her Life

🎾 **Pursue your dreams:** Pursuing one's dreams with passion and hard work can lead to great success.

🎾 **Believe in yourself:** Sania's unwavering self-belief in herself and her abilities enabled her to break barriers and become a trendsetter.

🎾 **Leave on your terms:** Sania chose to retire when she wanted to despite having an illustrious career.

🎾 **Be a path-breaker:** Sania Mirza was a path-breaker, and her tennis career became a source of inspiration for many young women in India.

🎾 **Perseverance is key:** Sania's success story shows the importance of perseverance and hard work in achieving one's goals.

🎾 **Pressure is part of life:** Sania believes that everyone is under pressure in all walks of life, and one needs to embrace it to thrive.

Sania Mirza

India's 80th Grandmaster

- India's chess player Vignesh NR of Chennai has become India's 80th Grandmaster.

- He won the 24th NordWest Cup 2023 at Bad Zwischenahn in Germany.

- Vignesh's elder brother Visakh NR had also become India's 59th GM in 2019.

- Thus, Visakh and Vignesh become India's first brothers who are Grandmasters.

3. PLACES

Assam's CharaideoMoidams

- The Centre has decided to nominate the CharaideoMaidams in Assam for the UNESCO World Heritage Centre.
- If selected, Assam will have three world heritage sites, the other two being Kaziranga National Park and Manas National Park.
- But there is currently no World Heritage Site in the category of cultural heritage in Northeast India.
- The CharaideoMaidams, represents the late medieval mound burial tradition of the Tai Ahom community in Assam.
- Out of 386 Maidams or Moidams explored so far, 90 royal burials at Charaideo are the best preserved.
- As of now, only 30 of those royal burial mounds are under the protection of the Archaeological Survey of India.

4. Events/Awards

Padma awardees in Tamilnadu

- Six persons from Tamil Nadu and one from Puducherry have been chosen for the Padma Awards this year for their contribution in their respective fields, including medicine, art and social work.
- Expert snake catchers from the Irula community, Vadivel Gopal and Masi Sadaiyan, were selected for the Padma Shree award.
- While renowned singer Vani Jairam has been selected for the Padma Bhushan award, Palam Kalyana Sundaram (Social Work), Dr. GopalsamyVeluchamy (Medicine), K Kalyanasundaram Pillai (Art) from Tamil Nadu have been chosen for Padma Shree.
- Dr. Nalini Parthasarathi (Medicine) of Puducherry has also been selected for Padma Shree.
- Dr Veluchamy was among the first to suggest 'kabasurakudineeer' as a potential drug for Covid-19 management.
- Vani Jairam is the only person from Tamil Nadu to get the prestigious Padma Bhushan

Republic Day 2023 – IMPORTANCE

- Egyptian President Abdel Fattah El-Sisi was the Chief Guest at the parade.
- For the first time, 12 women riders will be part of the Camel Contingent of the Border Security Force (BSF) and among the 16 marching contingents.
- This year, only Made-in-India weapon systems will be showcased at the Republic Day parade, keeping with the theme of "Atmanirbhar Bharat".
- The newly-recruited Agniveers will also be a part of the parade for the first time.
- The Narcotics Control Bureau will also showcase a tableau for the first time.
- For the first time in India's independent history, the iconic 21-GUns Salute to the President during the parade will use 105 mm Indian Field Guns replacing the British-made 25-Pounder guns.
- For the first time, a 3-D anamorphic projection will be organised during the Beating the Retreat Ceremony on the facade of the North and South Block.

National Child Science Congress

- The National Council for Science and Technology operating recently organized the National Child Science Congress-2023.

- The congress was hosted by the Gujarat Council of Science City.

- It was held in Ahmedabad, Gujarat.

- The theme of the event was "Understanding Eco System for Health and Wellbeing".

- The National Child Science Congress is being held in the country since 1993.

Grammy Award 2023

- India's Ricky Kej won the Grammy this year for his album Divine Tides.

- His album was nominated in the Best Immersive Audio Album category

- Kej has become the only Indian to hold three Grammy Awards and only the fourth Indian to do so.

Sansad Ratna Awards

- Context: The PM of India congratulated fellow Members of Parliament (MPs) who will be conferred the Sansad Ratna Awards 2023.

The Sansad Ratna Awards:

- They were instituted in 2010, inspired by the teachings of former President APJ Abdul Kalam, who launched the first edition of the Award function in Chennai.

- They sePresidnentrecognise and felicitate the top-performing MPs on the basis of their work in the apex legislative body.

- Its jury committee comprises eminent Parliamentarians and members of civil society and was chaired by the MoS, Parliamentary Affairs and co-chaired by T S Krishnamurthy (Former Chief Election Commissioner of India).

- The Awards are not given by the Government of India. It is the Prime Point Foundation which runs the awards show.

Jeevan Raksha Padax series of Awards – 2022

- President approval conferment of Jeevan Raksha Padak series of Awards 2022

- Awards is given to a person for meritorious act of human nature in saving the life of a person

- It is given in three categories, namely Sarvotlam Jeevan Raksha Padak; Uttam Jeevan Raksha Pathak; Jeevan RahshaPadak.

- Persons of all walks of life are eligible for these awards.

- It can also be conferred posthumously.

5. Historic persons

200th birth anniversary of Dayanand Saraswati (1824-1883)

- Context: PM inaugurated celebrations commemorating the 200th birth anniversary of social reformer and Arya Samaj founder Dayanand Saraswati

Other notable contributions:

- Book: Satyarth Prakash (Text on the philosophy of the Vedas)

- He was the first to give the call for Swaraj as "India for Indians" in 1876, a call later taken up by Lokmanya Tilak.

- Subsequently, former President of India, S. Radhakrishnan, called him one of the "makers of Modern India", as did Sri Aurobindo.

- Impact: These contributions have had a lasting impact on Indian society and continue to be relevant even today.

- In recent times, the government has been committed to celebrating social reformers and important personalities. E.g.

- The government declared the birth anniversary of Birsa Muda as the Janjatiya Gaurav Diwas.

- The National Unity Day or Rashtriya Ekta Diwas is celebrated every year on October 31to commemorate the birth anniversary of Sardar Vallabhbhai Patel.

200th birth anniversary of Dayanand Saraswati (1824-1883)

Dayanand Saraswati (Maharshi Dayanand) was philosopher, social leader and founder of the Arya Samaj, a reform movement of the Vedic dharma.

His contributions:

- **Education:** He and was one of the first to advocate for the **education of women in India**. He advocated for the **use of the Sanskrit language** as a medium of instruction in schools.

- **Hindu Reform Movement:** He sought to promote the values of the Vedas in modern society.

- **Social Reform:** He sought to eliminate practices such as child marriage, sati, and the caste system.

- **Nationalism:** He was a strong advocate of Indian nationalism and believed in the power of India to reclaim its status as a great civilization.

- He encouraged the **study of Indian history and culture, and encouraged Indians** to be proud of their heritage.

- **Environmentalism:** He encouraged the planting of trees, the protection of wildlife, and the conservation of natural resources.

- **Scientific Thought:** He encouraged the critical examination of religious texts and beliefs and sought to promote a rational and scientific approach to religion.

6. Books

- 'Victory City': A brief history of the kingdom of Vijayanagara
- Salman Rushdie released a new novel "Victory City" – a fictionalized story of the Vijayanagara Kingdom.

IV. History – Historical Events

MARTYRS' DAY

- Context: The nation paid homage to the Father of the Nation Mahatma Gandhi on his 75th death anniversary (30th January 1948). The day is also observed as Martyrs' Day.

Gandhiji's role in Freedom Struggle:

Outside India:

- Natal protest – Gandhi organized Indian resistance, fought anti-Indian legislation in the courts and led large protests against the colonial government.
- Satyagraha Against registration certificates
- It was in South Africa that Mahatma Gandhi first forged the distinctive techniques of non-violent protest known as Satyagraha.

In India:

- Champaran Satyagraha (1917)
- Ahmedabad mill strike (1918)
- Kheda Satyagarha (1918)
- Rowlatt Satyagraha
- Khilafat and Non-cooperation movement
- Civil disobedience movement
- Protest against the Macdonald award
- Quit India Movement

The vows of Gandhi

- India's independence leader Mahatma Gandhi espoused virtues of non-violence, truth, peace and simplicity
- **Ahimsa :** Non-violence
- **Sparshbhavana :** Against idea of untouchability
- **Swadeshi :** Use locally- made goods
- **Sarva Dharma Samantva :** Equality of all religions
- **Sarvatra Bhayavarjana :** Fearlessness
- **Aswada :** Control of diet
- **Satya :** Truthfulness
- **Asteya :** No stealing
- **Brahmacharya :** Self-discipline including chastity
- **Aparigraha :** No possessions
- **Sharirshrama :** Working for daily food

Conclusion:

- As we celebrate the Azadi Ka Amrit Mahotsav, let us also recall how the Gandhian values of non-violence, inclusiveness and communal harmony enabled India to establish a unique democracy achieving momentous economic and social transformation through the ballot box rather than through the barrel of the gun.

Whom do u think we need more of today, Gandhi or Ambedkar?

Both are needed for :
- Mixture of Modern world+ Traditional values
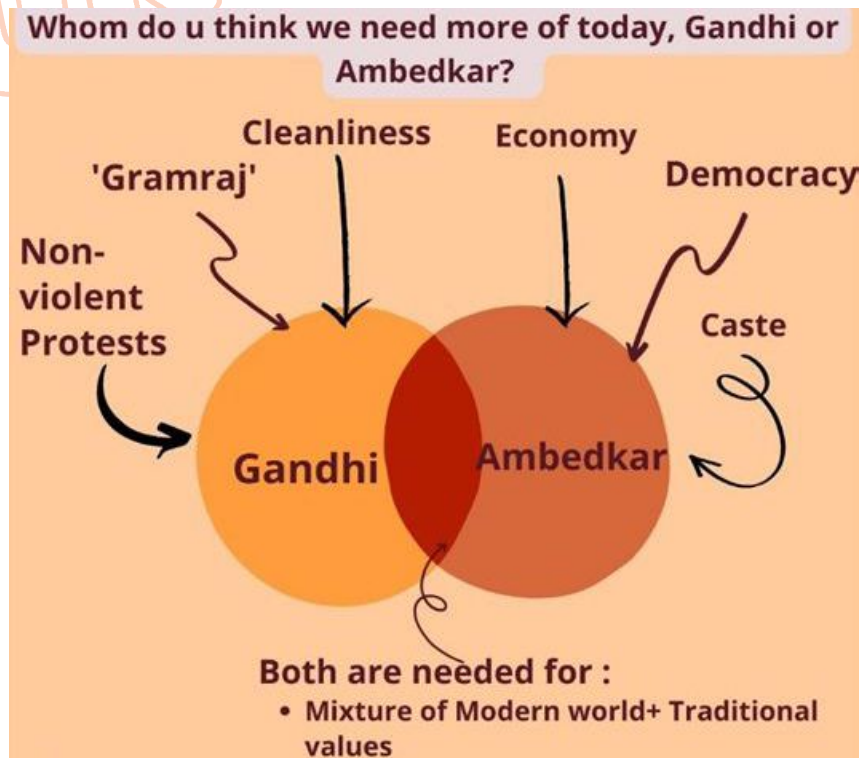
GANDHI'S GLOBAL FOOTPRINT

- The Indian independence movement may have witnessed the heyday of Gandhian non-violent action, but the ripples it left behind touched many other nations and influenced varied ideoligies. Here's a snapshot of Gandhi's global impact.

- Gandhian non-violence was already invoked during his lifetime by Khan Abdul Ghaffar Khan, also known as the "Frontier Gandhi". Few people know about Khan Abdul Ghaffar Khan as a Muslim proponent of non-violence, who stressed the compatibility of Islam and Satyagraha

- Effective non-violent actions led by Nelson Mandela played a crucial role in crippling the brutal and racist apartheid regime in South Africa, helping establish a legitimate, democratically elected black majority government

- Often labelled as the "American Gandhi", Dr. Martin Luther King, Jr.

- recognized the value of Gandhi's legacy of non-violence and used it to strengthen his own campaigns in areas ranging from racial integration to voting rights

- The non-violent Arab Spring awakenings in West Asia from 2009 to 2012 demon- strated that Gandhian non-violence could help to provide the disobedient space that is needed

V. POLITY– POLITICAL PARTIES &POLITICAL SYSTEM IN INDIA

Mega projects for Andaman and Nicobar

- Context: The representation of nearly 100 former civil servants wrote to President DroupadiMurmu against development plans on Great Nicobar Island.

- In other news, SC panel questions need to revive oil palm plantations in Andamans.

About the Great Nicobar Project

- Ministry of Environment, Forest and Climate Change (MoEFCC) last year (November 2022) granted an in-principal clearance for the diversion of 130 sq km of forest in Great Nicobar Island for the mega project.

- The project includes a transhipment port, an airport, a power plant and a greenfield township.

- Implemented by Andaman and Nicobar Islands Integrated Development Corporation under a vision plan conceived by the NITI Aayog.

- It includes compensatory afforestation on "non-notified forest land" in Haryana.

About the ecology of A&N:

- A&N has India's largest mangroves and that
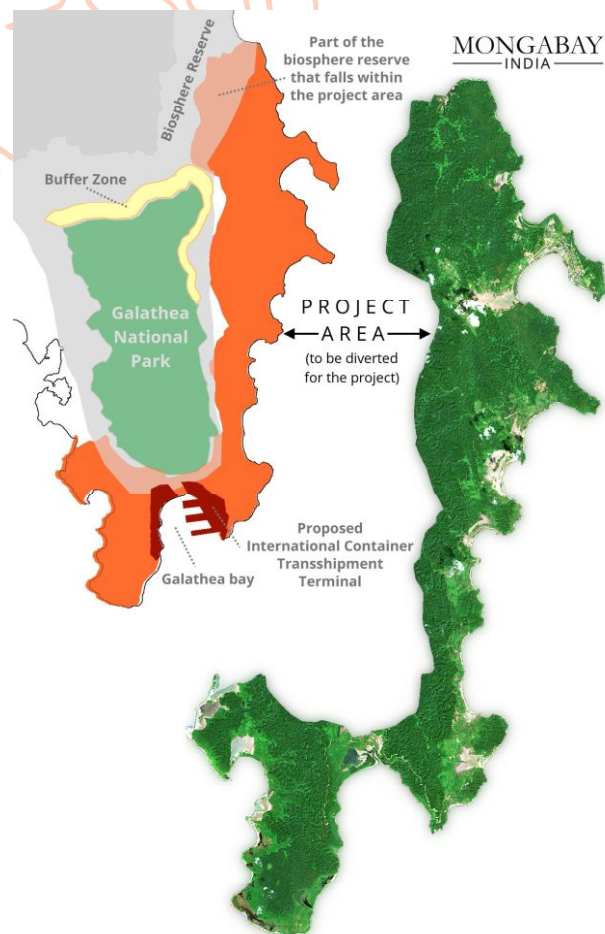
over half the species of butterflies, 40% of birds and 60% of mammals are endemic to the region. The project is likely catastrophic for the island's sensitive ecology and indigenous hunter-gatherer tribes like the Shompen who are already listed as a 'particularly vulnerable tribal group'.

- Fig: Ministry of Ports, Shipping and Waterways will be inviting expressions of interest (EOI) from January 28, 2023, for the development of a Mega International Container Transhipment Port (ICTP) at Galathea Bay of Great Nicobar Island in the Bay of Bengal

Centre to roll out process to set up 16th Finance commission soon

- Context: The government will soon kick off the process to set up the 16th Finance Commission, with the Finance Ministry likely to notify the terms of reference (ToR) of the constitutional body.

Background:

- The 15th Finance Commission (FFC chaired by NK Singh) was set up in (November 2017) with a mandate to make recommendations for the five-year period from 2020-21.
  - ○ The Commission is usually granted about two years to deliberate on its terms of reference, consult States and frame its recommendations.

- ○ The government should ideally have its report by October 2025 to consider it in time for Budget 2026-27, where it will have to place its action taken report on the Commission's report.

- Despite the Constitution's mandate to establish an FC every five years, breaking the trend, the 15th FC's term was extended by a year, ending in 2025–2026.

- In late 2019, the Commission was asked to give a standalone report for 2020-21 and another report for an extended five-year period till 2025-26.

- Since the FFC report covered six years (instead of five), the next FC must be selected this year.

- The last time an FC was granted a six-year time frame was for the 9th FC, formed in June 1987.

- The 10th FC was still constituted in June 1992 within the five-year deadline specified by Article 280 of the Constitution, which has not been the case this time.

What is the Finance Commission?

- It is a constitutional body constituted every 5 years by the President of India under Article 280 of the Indian Constitution to define the Centre-state's financial relations.

Why is there a need for an FC?

- The Indian federal system allows for the division of power and responsibilities between the Centre and states.

- Correspondingly, the taxation powers are also broadly divided between the Centre (collects the majority of the tax revenue) and states (responsible for delivering public goods in their areas).

- Sometimes, due to this and also due to vast regional disparities, states may incur expenditures higher than the revenue generated by them.

- To address these imbalances, the FC recommends the extent of central funds to be shared with states.

- Thus, it is considered the balancing wheel of fiscal federalism in India.

The first step towards establishing 16th FC:

- While the ToR (Terms of Reference) for the 16th FC will be worked out after internal government deliberations steered by the Finance Ministry, the appointment of an Officer on Special Duty to drive the process.

- This officer typically becomes the member-secretary of the Commission, once it is constituted.

The key challenges for the 16th FC:

- The co-existence of another permanent constitutional body – the GST Council.
  - ○ The Council's decisions on tax rate changes could alter the revenue calculations made by the FC for sharing fiscal resources.

- The government usually accepts recommendations on

States' share of tax devolution and the trajectory for fiscal targets and ignores most other suggestions. For instance,

○ The government ignored the FFC's suggestion of creating a Fiscal Council where the Centre and States collectively work out India's macro-fiscal management challenges.

○ The government has accepted the FFC's recommendation to set up a non-lapsable fund for internal security and defence 'in principle', but its implementation still has to be worked out.

Way ahead:

• A recourse mechanism can be put in place for the Commission to revisit its numbers due to the GST Council's decisions.

• The governments must rise beyond politics to deliberate and implement FC's recommendations, which are sound in terms of policy and economics.

Union Budget 2023-24

• Context: While presenting the Union Budget 2023-24 in the Lok Sabha, the Union Finance Minister emphasised that the Indian economy is on the right track, and despite a time of challenges, heading towards a bright future.

What is the 'Union Budget'?
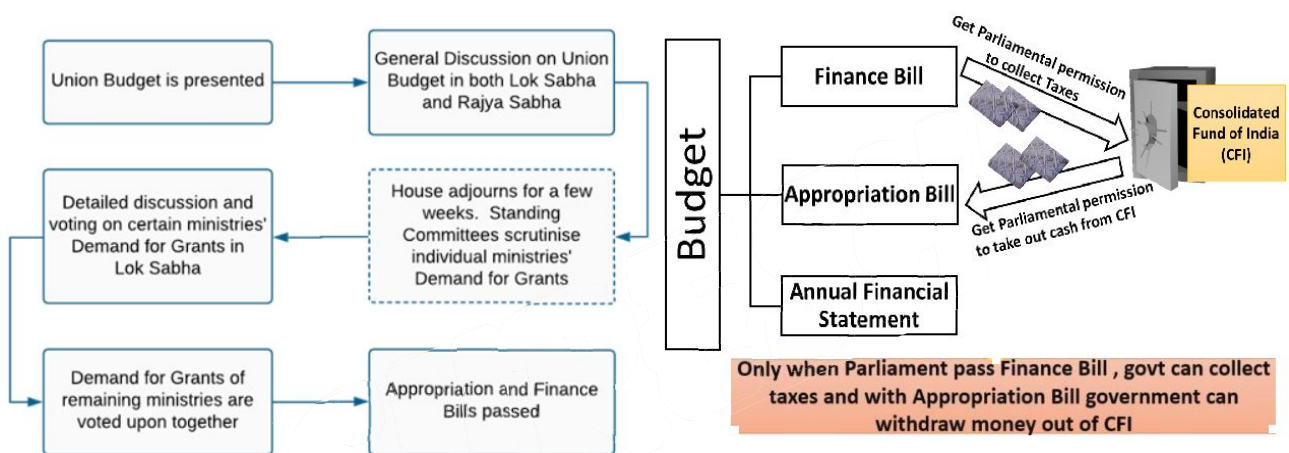
• According to Article 112 of the Indian Constitution, the annual financial statement is a statement of the estimated receipts and expenditures of the government for a particular year.

• The receipts and expenditures are shown under three parts, namely, the Consolidated Fund of India & the Public Account of India (Article 266), & the Contingency Fund of India (Article 267).

• It is prepared by the Department of Economic Affairs, Ministry of Finance, for the fiscal year that runs from 1st April to 31st March.

Annual Financial Statement					
Revenue Budget			Capital Budget		
Revenue Receipts		Revenue Expenditure	Capital Receipts	Capital Expenditure	
Tax receipts	Non-tax receipts				
Direct and Indirect taxes	PSU profits, interest or loans received, etc.	Subsidies, salaries, pensions, interest payments, etc.	Disinvestment proceeds, Borrowings, Recovery of past loans, etc.	Expenditure on infrastructure, asset creation, loans to states, etc.	

Types of Deficits	Description
Budget Deficit	Difference between total expenditure & total receipts.
Fiscal Deficit	Total expenditure - (Revenue receipts + Capital receipts which are non- debt imposing)

Revenue Deficit	Difference between revenue expenditure and revenue receipts.
Primary Deficit	The part of the Fiscal Deficit that excludes interest payment amount.
Effective Revenue Deficit	Revenue Deficit - Grants for the creation of capital assets

Highlights of the Union Budget 2023-24 speech:

• Resilience amidst multiple crises: The economic growth is estimated at 7%, which is the highest among all major economies, despite the massive global slowdown caused by COVID-19 and Russia-Ukraine War.

• G20 Presidency: With the theme of 'VasudhaivaKutumbakam', India is steering an ambitious, people-centric agenda to address global challenges and facilitate sustainable economic development.

Achievements since 2014 – Leaving no one behind:

• Vision for Amrit Kaal – An empowered and inclusive economy:

• Future prospects: This Budget

    ○ The term 'Amrit Kaal' comes from Vedic astrology and indicates a sort of golden era.

    ○ It signifies that the coming period in India is going to be its most prosperous, with economic growth and social justice.

    ○ 'Amrit Kaal' also describes the hope for a better future, where India would be self-reliant and fulfil all of its humanitarian obligations.
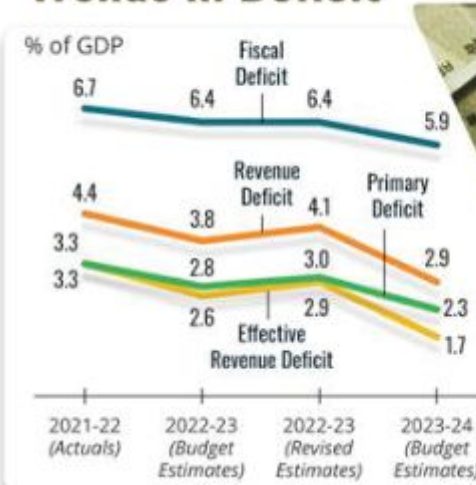
hopes to build on the foundation laid in the previous Budget, and the blueprint drawn for India@100, which envisions a prosperous and inclusive India.

The Budget Estimates 2023-24:

- The total receipts other than borrowings and the total expenditure are estimated at Rs 27.2 lakh crore and Rs 45 lakh crore respectively.

- The net tax receipts are estimated at Rs 23.3 lakh crore and the fiscal deficit is estimated to be 9% of GDP.
  - Set to benefit the economy because it means more funds available for private players.
  - The government has decided to continue the path of fiscal consolidation, reaching a fiscal deficit of below 4.5% by 2025-26.

- To finance the fiscal deficit in 2023-24, the net market borrowings from dated securities are estimated at Rs 11.8 lakh crore.
  - The balance financing is expected to come from small savings and other sources.
  - The gross market borrowings are estimated at Rs 15.4 lakh crore.

- The capital expenditure by the government has been raised to Rs 10 lakh crore. This is more than double the amount of money allocated when compared to 2020-21.
  - Capital expenditure is the money that is spent on building productive assets such as roads and bridges and ports.
  - This has a greater return to the economy and every Rs 100 spent leads to a Rs 250 gain for the economy. Revenue expenditure returns less than Rs 100.

SUBSTANTIAL RELIEF IN PERSONAL INCOME TAX

BENEFITING OUR HARD-WORKING MIDDLE CLASS

- No Income tax for persons with income up to **7 lakh** in the new tax regime
- Standard deduction of 50,000 to salaried people and deduction up to 15,000 for pensioners under new tax regime also
- Reduction of the highest surcharge rate from **37% to 25%** under new tax regime
- Tax exemption limit on leave encashment on retirement of non-govt salaried employees increased to 25 lakh

UNION BUDGET 2023-24

SUBSTANTIAL RELIEF IN PERSONAL INCOME TAX

CHANGE OF TAX STRUCTURE IN NEW PERSONAL INCOME TAX REGIME:
- Tax slabs reduced to 5
- Tax exemption limit increased to ₹3 lakh

Tax Slab (in lakh)	Tax Rate (in %)
0-3	Nil
3-6	5
6-9	10
9-12	15
12-15	20
Above 15	30

UNION BUDGET 2023-24

Personal Income Tax

- The rebate limit in the new tax regime has been increased to ₹ 7 lakh, meaning that peons in the new tax regime with income up to ₹ 7 lakh will not have to pay any tax.

- The tax structure in the new personal tax regime has been changed by reducing the number of slabs to five and increasing the tax exemption limit to ₹ 3 lakh.

Indirect Tax Proposals:

- It emphasised simplification of tax structure with fewer tax rates so as to help in reducing compliance burden and improving tax administration.

- The number of basic customs duty rates on goods, other than textiles and agriculture, has been reduced from 21 to 13.

- Better targeting of tax concessions: For better targeting of tax concessions and exemptions, the deduction from capital gains on investment in residential houses has been capped at ₹ 10 crores.

- Proposals relating to MSMEs: Describing MSMEs as growth engines of the Indian economy, the Budget proposes enhanced limits for micro-enterprises and certain professionals for availing the benefit of presumptive taxation.

- Cooperation: New cooperatives that commence manufacturing activities by 31st March next year shall get the benefit of a lower tax rate of 15%.

- Start-ups: The Budget proposes to extend the date of incorporation for income tax benefits to start-ups from 31.03.2023 to 31.03.2024.

- Amendments in CGST Act: The Budget provides for amending the CGST Act so as to raise the minimum threshold of tax amount for launching prosecution under GST from ₹ 1 crore to ₹ 2 crores.

- Implications of tax changes: The revenue of about ₹ 38,000 crores will be foregone as a result of these proposals in the direct and indirect taxes, while revenue of about ₹3,000 crores will be additionally mobilised.

No bar on contesting two seats in one poll

- Context: The Supreme Court has refused to set aside a provision in the election law which allows candidates to contest polls from two constituencies simultaneously.

- Previously, a petition had sought the court to declare Section 33(7) of the Representation of People Act invalid and ultra vires.

Why has SC rejected the Plea?

- The SC said that this is a policy matter and an issue concerning political democracy. It is for the Parliament to take a call (thus maintaining the Separation of Power Doctrine).

Legal Provisions:

- As per Section 33(7) of the RPA (Representation of the People Act), 1951, one candidate can contest from a maximum of two constituencies.

   o More than two constituencies were allowed until 1996 when the RPA was amended to set the cap at two constituencies.

Issues with contesting from two seats:

- Conflicts in the RPA laws: While 33(7)allows candidates to contest from two seats, Section 70 bars candidates from representing two constituencies in the Lok Sabha/state. Assembly.

- The strain on public finances: Lakhs of taxpayer rupees need to be shelled out because of a by-election that could have been easily avoided.

- Loss of electoral interest of voters: Repeated elections and a by-election would see fewer voters turn out to vote when

compared to the first election.

- Positives: It provides a "wider choice to the polity as well as candidates".

Previous Recommendations on the issues:

- Last year the Chief Election Commissioner had asked the Ministry of Law & Justice to limit the seats from which a candidate can contest to just one.

- Candidates to bear the financial burden of conducting the subsequent by-election in one of the constituencies (if one wins in both seats)

Conclusion

- It is time to modify "One person, one vote" and expand that principle to "One person, one vote; one candidate, one constituency.

India's big millets push, and why it makes sense to have these grains

Millets

Context: The Union Budget 2023-24 has accorded high priority to millets

About Millets

- Major Millets in India: jowar (sorghum), bajra (pearl millet) and ragi (finger millet).
- Indigenous varieties of "small millets" like kodo, kutki, chenna and sanwa.
- Earliest evidence of Millets found in Indus civilization : 3000 BC.

Climatic condition:

- Short growing season (70-100 days, as against 120-150 days for paddy/wheat)
- Lower water requirement (350-500 mm versus 600-1,200 mm).
- Can grow even in poor soil
- It is a Kharif crop

Haryana 8%
Rajasthan 43%
Uttar Pradesh 20%
Gujarat 10%
Madhya Pradesh 8%

Major producers include Rajasthan (highest), UP, Andhra Pradesh, Telangana, Karnataka, Tamil Nadu, Maharashtra, Gujarat and Haryana.

Production by District
2018-2019, metric tons
1 - 10,000
10,001 - 125,000
125,001 - 569,710
Percentage shown (%)

Arabian Sea

Map is for representation purpose only

2023 has been declared as International Year of Millets (IYM) by UN on a proposal by India.

TYPES OF MILLETS

Pearl Millet | Finger Millet
Foxtail Millet | Barnyard Millet
Kodo Millet | Sorghum | Little Millet

India (accounting for nearly 41% of world production), Nigeria and China are the largest producers of millets in the world, accounting for more than 55% of the global production.

- However, in recent years, millet production has increased dramatically in Africa. Production of millets has increased from 14.52 million tonnes in 2015-16 to 17.96 million tonnes in 2020-21.

India's efforts in pushing millets

- FSSAI: It will formulate guidelines to include millets in the food menu of schools, hospitals, and government canteens.
- "Millets canteen" to produce millets-based foods (in hospitals)
- The Youth Affairs Ministry: Webinars and conferences with leading athletes, nutritionists, and dieticians on millets through the Fit India app
- Ministry of Food Processing Industries: It has organized millet fair-cum-exhibitions in different states.

What are the benefits of millet?

- Eco-friendly: They require much less water than rice or wheat and can be grown in rain-fed areas without irrigation. They belong to the grass family & tend to be more tolerant to drought and extreme weather and can grow in poor soil and hilly areas.

- Healthy: Millets can be a healthier option to keep lifestyle diseases such as obesity and diabetes at bay.
- Millets have a much lower glycemic index - a measure of how much blood sugar levels spike after consuming a food item - than processed rice or wheat.
- Millets are also high in fibre content which is known to improve gut microbiota.
- They are rich in micronutrients such as iron and zinc, which can help reduce the country's burden of anaemia.
- Millets also contain niacin, which is linked to lowering triglycerides and increasing HDL or good cholesterol.
- Millets contain no gluten and suit people with gluten allergy and irritable bowel syndrome.

13 New governors

- As many as 12 states and Union Territory Ladakh got new governors on February 12, 2023.

Article 157 and Article 158 of the Constitution of India specify eligibility requirements for the post of governor.

- He is the part of federal system of Indian polity and acts as a bridge between union and state governments.
- The governor acts in 'Dual Capacity' as the Constitutional head of the state and as the representative.
- He is the constitutional head of the state, bound by the advice of his council of ministers.
- He functions as a vital link between the Union Government and the State Government.

PT Usha presided over the Rajya Sabha

- PD Usha chaired the Rajya Sabha for a while in the absence of Vice President and Rajya Sabha Speaker Jagdeep Dhankhar
- Franklin D. Roosevelt said that power carries great responsibility.

VI. Public Awarness and General Administration

Monuments under private sector

- Context: The government will hand over around 1,000 monuments to the private sector for their upkeep under the Monument Mitra Scheme.

About Monument Mitra Scheme / Adopt A Heritage:

- The Scheme was started a few years back under the Ministry of Tourism.
- It is now transferred to the Ministry of Culture in respect

of the monuments under the Archaeological Survey of India, the ASI.

- Applies to all Centrally protected heritage properties.
- IAims at ensuring quality & inclusive provision of amenities and facilities across heritage,

natural, & tourist sites through the active participation of private and public sector organizations and individuals.

- These organizations would be known as "Monument Mitras" for their collaboration initiative.

HOW TO BE A MONUMENT MITRA

- Select Tourist Places
- Submit Expression of Interest
- Shortlisting of EoI
- Vision Bidding and Evaluation
- Selection of Monument Mitra
- Signing of MOU

Ministry of Education releases All India Survey on Higher Education (AISHE) 2020-2021

- Context: The Union Ministry of Education released data from the All India Survey on Higher Education (AISHE), 2020-2021, which showed a 7.5% increase in student enrolments across the country compared to 2019-20.

About ASIHE Report:

- The All India Survey on Higher Education (AISHE) was initiated in 2011, during which data for the year 2010-11 was collected.
- The entire survey was conducted through electronic mode and a dedicated portal http://aishe.gov.in was developed for this purpose.

Key findings from the report:

- For the first time, the Higher Education Institutions (HEIs) of India have filled their data using an entirely online data collection platform through the Web Data Capture Format (Web DCF) developed by the Department of Higher Education and the National Informatics Centre (NIC).

Number of Institutions

- The number of Universities has increased by 70 during 2020-21, to 1,113 in 2020-21 from 1,043 in 2019-20.
- Uttar Pradesh, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Madhya Pradesh, Andhra Pradesh, Gujarat, Telangana, and Kerala are the top 10 States in terms of the number of colleges.
- Among the districts, the maximum number of colleges (1058) is situated in Bangalore Urban followed by Jaipur (671). About 32% of colleges are situated in 50 districts.

Student Enrolment in Higher Education:

- Total enrolment in higher education: It has increased to nearly 4.13 crore in 2020-21 from 3.85 crore in 2019-20 (an increase of 28.80 Lakh).
- Female enrolment increased from 18.8 million in 2019-20 to 20.1 million in 2020-2021
- SC: There were 2 lakh more SC students who got enrolled in 2020-21 compared to the previous year.
- ST: The year also saw about 3 lakh more ST students and 6 lakh more OBC students getting enrolled for higher education.
- According to the survey report, at the undergraduate level, enrolment was highest in humanities (nearly 33%), followed by science (nearly 15%), commerce, and engineering & technology. At the postgraduate level, the maximum number of students opted for social science followed by science
- Gender Parity Index (GPI) has increased from 1 in 2017-18 to 1.05 in 2020-21. More women enrolled themselves on science courses than men
  - The Gender Parity Index is a socioeconomic index usually designed to measure the relative access to education of males and females. This index is released by UNESCO.
- The top 6 States in terms of Student Enrolment are Uttar Pradesh, Maharashtra, Tamil Nadu, Madhya Pradesh, Karnataka, and Rajasthan.

Teaching and Non-Teaching Staff in Higher Education:

- The number of teachers has increased by 47,914 in 2020-21 over 2019-20.
- There are 75 female teachers per 100 male teachers.

Out-Turn

- The total number of pass-outs has increased to 95.4 Lakh in 2020-21 as against 94 Lakh in 2019-20.

Significance of Higher Education:

- Atmanirbhar Bharat: Self-reliant India needs a continuous supply of trained, skilled human resources
- Demographic Dividend
- Better Employment opportunities
- Economic development
- Technological advancements
- Solving Societal Issues
- Plurality, Inclusivity & Diversity: To develop the horizons of the mind, it is important to provide a diversified, plural environment.
- Empowerment of Women

Initiatives for Higher Education in India:

- National Education Policy (NEP) 2020
- RashtriyaUcchatar Shiksha Abhiyan (RUSA)
- Project Education Quality Upgradation and Inclusion Programme (EQUIP)
- Prime Minister's Research Fellowship (PMRF): Attract the talent pool of PhD programmes
- Paramarsh/Mentor-Mentee Relationship:Under this scheme, accredited institutions would help aspiring institutions that want to get accredited.
- Scheme for Promotion of Academic and Research Collaboration (SPARC):It aims to improve the research ecosystem
- Global Initiative for Academic Network (GIAN):It aims to tap the talent pool of scientists and entrepreneurs from abroad.
- Formation of Higher Education Financing Agency (HEFA): It aims to finance the creation of capital assets in premier educational institutions in India.
- Institutes of Eminence (IoE) Scheme: It aims to provide opportunities for a few chosen institutions to grow in the direction of being renowned globally for their excellence.
- SWAYAM Portal

Way Forward:

- There is a need to shift focus from enrolment to attendance.
- Multi-stakeholder approach: Extensive consultation involving parents, local self-governments, and civil society are key.

How a chatGPT-based chatbot can help rural India?

What is ChatGPT?

- ChatGPT is an AI-powered chatbot developed by the AI startup OpenAI. The technology functions by leveraging extensive data to learn how to respond to user prompt in a human-like manner, providing information similar to a search engine.

What is a Chatbot?

- A chatbot is a software that simulates human-like conversations with users via chat.
- A chatGPT-based chatbot can help rural India in several ways:
- Providing access to information: E.g. healthcare, education, agriculture, and government schemes.
  - In a recent demo, the Chatbot seamlessly responded to a query on PM Awas Yojana– made through a voice note.
- Improving access to services: E.g. banking, insurance, and healthcare. This can help bridge the gap between urban and rural areas and improve the quality of life for rural residents.
- Providing language support: It supports multiple languages. More languages are being integrated through BhashiniDaan Mission.
- Enhancing financial inclusion: By promoting financial literacy and encouraging savings among rural residents.

Steps to overcome limitations:

- Government is yet to build a National Digital public platform for Indian languages
- Reducing the digital divide in rural India
- Enabling access to affordable technology
- Reducing behavioural resistance to new technologies

Conclusion:

- A chatGPT-based chatbot can help to improve the quality of life for rural residents by providing access to information and services that are otherwise difficult to obtain.

BHASHINI Mission

- Under Bhashini Mission, a team at MeitY is currently building a WhatsApp-based chatbot that relies on information generated by ChatGPT to return appropriate responses to queries.

- BHASHINI Mission is a local language translation mission that aims to enable easy access to the internet and digital services in Indian languages, including voice-based access, and help the creation of content in Indian languages.

- It will also provide AI-based resources to Indian MSMEs, startups and innovators in the public domain

What is Bhasha Daan?

- It is an ambitious project which aims to crowdsource voice datasets in multiple Indian languages as part of Project BHASHINI.

- On the project's website, people can contribute in three key ways:

- By recording their voice samples in multiple Indian languages

- By typing out a sentence being played

- By translating text from one language into another.

Cadaver organ transplants

- Context: The Union Health Ministry has done away with the age cap of 65 years for receiving an organ from a dead donor (cadaver).

What do the new guidelines say:

- The Elderly can now register to receive organs from deceased donors

  ○ Previously, NOTTO (National Organ and Tissue Transplant Organisation) guidelines barred them. This violated the Right to Life of elderly

  ○ Preference will still be given to younger recipients, those above the age of 65 will not be completely barred from the process

- A patient irrespective of domicile State can register in any other State for a transplant (previously a domicile certificate was necessary)

- The patient will be allotted a unique ID by NOTTO upon registering. This will help in charting a 'One Nation One Policy,' for organ donation and transplantation

- Health Ministry has intimated states to stop charging registration fees to patients.

- For awareness generation: The government is introducing a chapter in the school curriculum regarding organ donation awareness for students.

Status of Organ Donation in India:

- India conducts the third-highest number of transplants in the world. Every year, an estimated 5-2 lakh people need a kidney transplant.

- Organs from deceased donors accounted for nearly 18% of all transplants in 2022 in the country

- Telangana, Tamil Nadu, Maha-

rashtra, Gujarat, and Karnataka account for more than 85% of the total deceased donations.

- A study shows over 40% of those in need of kidney transplants worldwide are over the age of 65.

- As per the Health Ministry, the number of organ transplants has increased by over three times from 4,990 in 2013 to 15,561 in 2022.

- India has an organ donation rate of about 52 per million population. In comparison, the organ donation rate in Spain is 49.6 per million population which is the highest in the world.

- The current mechanism of Donating organs: The availability of an organ is reported by the hospital to the state organ and tissue transplant organisation that matches it with recipients locally. If a match isn't found, it is referred to the regional office and then to NOTTO

Measures that can be taken:

- Employ more transplant coordinators (to explain and guide the families through the process of donation)

- Introduce Opt-out system: In India consent of family members is mandatory. Spain has an opt-out system where a person is presumed to be a donor unless otherwise specified.

- Generate more awareness about organ transplants so that people register as donors.

- Have faith that the donated organs are helping others.
- Use of technologyg. Drones to transport organs between cities and states

About NOTTO:

- National Organ and Tissue Transplant Organization (NOT-TO) is a national-level organisation set up under the Directorate General of Health Services, Ministry of Health and Family Welfare.

Vibrant Villages Programme

- Context: The Union Cabinet has approved the Centrally Sponsored Scheme– "Vibrant Villages Programme" (VVP) for the Financial Years 2022-23 to 2025-26.

About the Scheme:

- Comprehensive development of villages of blocks on the northern border thus improving the quality of life of people living in identified border villages.
- The scheme will provide funds for the development of essential infrastructure and the creation of livelihood opportunities in 19 Districts and 46 Border blocks 4 states and 1 UT along the northern land border of the country which will help in achieving inclusive growth.
- Vibrant Village Action Plans will be created by district administration with the help of Gram Panchayats. Development of

growth centres on the Hub and Spoke Model through the promotion of social entrepreneurship, youth and women empowerment etc.

Benefits:

- This will help in encouraging people to stay in their native locations in border areas and reversing the outmigration from these villages adding to improved security of the border.
- Connectivity with the all-weather road, drinking water, 24×7 electricity with a focus on Solar and wind energy, mobile and internet connectivity.

Lead poisoning

- Context: Lead poisoning is a huge public health concern in India

About Lead Poisoning

- It is a type of poisoning that occurs when lead accumulates in the body, often over a period of months or years.
  - Children are particularly vulnerable to lead poisoning because their bodies are still developing.
  - 23 states exceed the permissible blood lead level of 5 μg/dL margin (WHO safe limit)
- Symptoms: Fatigue, Abdominal

pain, nausea, diarrhoea, loss of appetite, anaemia, a dark line along the gums, and muscle paralysis or weakness of limbs.

Implications:

- High Blood Lead Levels: Half the children in India report high blood lead levels (UNICEF report)
- Disability-Adjusted Life Years: Lead toxicity in India contributes to 4.6 million Disability-Adjusted Life Years (number of years lost due to disease burden) and 165,000 deaths annually.
- Adverse Health Impact: Once lead enters the bloodstream, it goes directly to the brain, particularly in children.

Steps taken:

- Lead Occupational Safety and Health Administration Regulations protect workers from toxic metal exposure.
- Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011. Battery Waste Management Rules, 2022

Everyday risks

- There is potential for lead exposure in several common occupations and products that are used in nearly every household

Occupational Sources	Non-Occupational Sources
Battery work	Traditional medicine
Mining	Vehicular exhaust
Glass manufacturing	Contaminated cosmetics and sindoor

Automobile repair	Household storage batteries
Ceramic work	Household paints
Painting	Contaminated spices
Pottery	Effluent from lead-based industries
Smelting	Contaminated soil, dust and water near lead-based industries
Printing work	Food grown in lead contaminated areas
Plumbing	Retained bullets
Soldering	Food stored or cooked in lead-coated vessels
Making lead pipes and plastic	Painted toys

The Foundational Literacy and Numeracy Report

- Context: The 2nd edition of the Foundational Literacy and Numeracy (FLN) report was released by Dr Bibek Debroy, Chairman EAC-PM.

FLN:

- It is the ability of a child (between the ages of 3 and 8 years old) to read basic texts and do basic mathematical problems such as addition and subtraction.
- It is one of the main elements of the National Education Policy (NEP) 2020.

About the FLN report:

- It is a benchmark for states and UTs to track their performance in achieving universal foundational learning by 2026-27.
- Its findings cover the role of nutrition, access to digital technology and language-focused instructional approach.

It captures:

- The role of language in education and highlights distinct challenges faced in a multilingual environment.
- The fundamental concepts children require to become skilled readers.
- Improving the learning outcomes using appropriate assessments and medium of instruction.

Recommendations:

- Need to integrate the medium of instruction and teaching in languages familiar to children.
- Undertake various assessments pertaining to the –
  - Linguistic system (includes phonology, vocabulary/lexicon, and syntax),
  - Orthographic system (includes symbols and mapping principles), and
  - Writing mechanisms
- Need for data monitoring along with clearly defined outcome-based indicators on pedagogical framework & education in India.

Initiatives to promote FLN:

- DIKSHA or Digital Infrastructure for Knowledge Sharing: Launched in 2017, it is a national platform of the NCERT, where teachers can find interactive and engaging teaching material to make their classes interesting.
- NIPUN Bharat Mission: Launched in 2021 for ensuring that every child in the country necessarily attains foundational literacy by the end of the third grade by the year 2026-27.
- NISHTHA: A new training program (in FLN) for the teachers, as well as the heads of the school launched by the NCERT.
- The National Curriculum Framework for Foundational Skills 2022: To meet a key focus area of the NEP 2020, to improve the foundational skills of students.
  - Under this, 'jaduipitara' – learning and teaching material for the foundational stage of schooling, has been launched recently.

Integrative Medicine Centres

- The Centre has decided to open

Integrative Medicine Centres at all government medical establishments in the country especially at AIIMS.

- The Opening such centres will help in harmonising the Indian and modern systems of medicine and providing joint multidisciplinary care to patients.
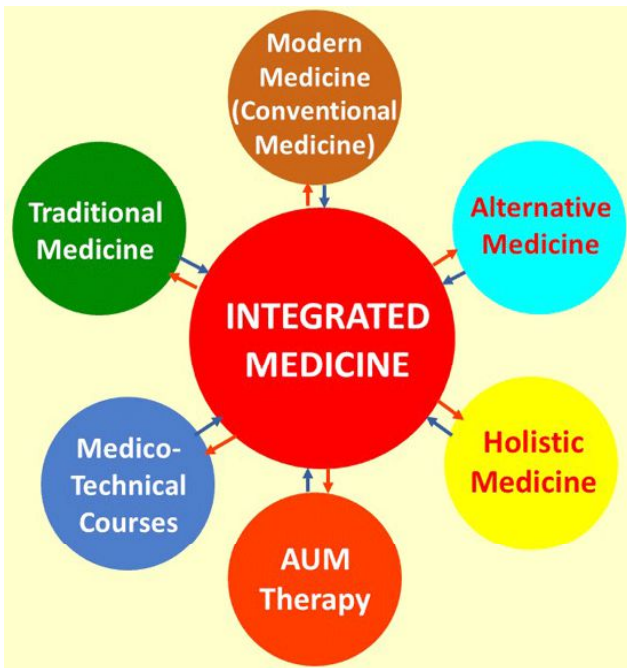
- Integrative medicine is aimed at harnessing the potential of India's rich heritage and medical knowledge, along with using modern advancements in allopathy.

Delhi-Mumbai Express Highway

- This road is being constructed for a distance of 1386 km at a cost of Rs 1.03 lakh crore to connect six states namely Delhi, Haryana, Rajasthan, Madhya Pradesh, Gujarat and Maharashtra.

- It is the longest expressway in the country.

- The expressway, which is currently being constructed as an eight-lane road, has scope for expansion into a 12-lane road.

- The road from Delhi to Mumbai is being constructed using German technology.

- You can travel at a speed of 120 km per hour on this road

- Rest areas are allotted at intervals of 50 kms

- Facilities like accommodation, ATM, grocery store are being made there

- Medical centers are set up every 100 km

- You can travel at a speed of 120 km per hour on this road

- Rest areas are allotted at intervals of 50 kms

- Facilities like accommodation, ATM, grocery store are being made there

- Medical centers are set up every 100 km

VII. Welfare Oriented Schemes and their Utility Problem in Public Delivery System (Central Government and State Government)

1. Central Government

U-WIN portal

- After the success of the Co-WIN platform, the government has now replicated it to set up an electronic registry for routine vaccinations Named U-WIN.

- This programme digitises India's Universal Immunisation Programme (UIP).

- It has been launched in a pilot mode in two districts of each state and Union Territory.
- The U-WIN is going to be the single source of information for immunisation services, updating vaccination status, delivery outcome, planning of RI sessions and reports like antigen-wise coverage, etc.

Merger of CGHS with Ayushman Bharat

- Ayushman Bharat and Central Government Health Scheme (CGHS), are two separate health insurance schemes run by the government.
- Central government plans to merge all existing state and central government-run health insurance schemes under the Ayushman Bharat umbrella.
- Ayushman Bharat was launched in September 2018.
- The scheme provides an annual health cover of Rs 5 lakh per family to more than 10.74 crore poor families - about 50 crore people.
- It covers secondary and tertiary care hospitalisation.
- Central Government Health Scheme (CGHS) is providing comprehensive medical care to the Central Government employees and pensioners enrolled under the scheme.

Millet Procurement in India

- The Government of India is expecting the millet production to increase to forty to fifty lakh tonnes.
- In 2023, the millet production in the country is around six to seven lakh tonnes.
- The increase in millet production is mainly because of nine states.
- They are MP, UP, Haryana, TN, Gujarat, Odisha, Uttarakhand, Karnataka, and Maharashtra.
- 41% of the world's millet grows in India.
- India is one of the largest millet producers in the world.

Mandatory Minimum Sentences

- Context: A CJI -led bench has decided to examine a petition challenging mandatory minimum sentencing in the case of gang rape of a minor below the age of 12.

About Mandatory minimum sentences:

- As per the 2016 ruling in 'Mohd Hashim vs State Of UP And Others'.
- The concept of mandatory minimum sentencing refers to "a sentence which must be imposed without leaving any discretion to the court.

- It means a quantum of punishment that cannot be reduced below the period fixed,
- A concept that comes primarily from the Canadian and American legal systems; in India, such sentences are prescribed for all sexual offenses under the Prevention of Children from Sexual Offences (POCSO) Act except the offense of sexual harassment.

What are the arguments for and against?

For:

- It limits the scope for judicial discretion and arbitrariness, thereby enhancing the cause of justice.
- It acts as a deterrent for serious or harsh offenses by ensuring that the perpetrator doesn't go unpunished.

Against:

- This leads to overcrowding of prisons and is unfair as the convict's mitigating circumstances, such as if they are a first-time offender or the sole breadwinner in the family, are often overlooked.

2. State Government

TAMILNADU CM on Field Visit

- Chief Minister MK Stalin will be launching a new initiative - Kala AaivilMudhalvar (Chief Minister on Field Visit) on February 1 and 2 from Vellore district.

- It aims to review the progress of the welfare and developmental schemes in four districts - Vellore, Ranipet, Thirupathur and Thiruvannamlai.

- He will visit the entire state zone-wise in the coming months.

- For this purpose, all districts are likely to be divided into 10 zones, with each zone having four or five districts.

Jharkhand's First Survey of Migrants

- Context: The first Jharkhand Migrant Survey (JMS) was recently conducted across 24 districts of the state.

Background:

- Nearly 8.5 lakh migrant workers belonging to the state travelled back to Jharkhand during the Covid crisis.

- The lessons from that journey have now prompted the state government to launch a key exercise for its migrant population,

  ○ To map the major sectors of engagement for migrant workers,

  ○ Find the social security benefits available to their families and

  ○ Identify the health hazards they face.

- The initiative is part of the state's Safe and Responsible Migration Initiative (SRMI), which was launched in 2021-end and includes the preparation of a database of migrant workers.

- Jharkhand is not the only state to conduct migrant labour surveys. Kerala has been a pioneer in this field, followed by states like Tamil Nadu and Punjab.

- But there is a basic difference in labour movement between Kerala and Jharkhand. In Kerala, workers mostly go abroad (mainly to Gulf countries). However, the issue is internal migration in Jharkhand.

Overview of Migration:

- Migration is the movement of people away from their usual place of residence, across either internal (within the country) or international (across countries) borders.

- As per the 2011 Census data, India had 6 crore migrants in 2011 (38% of the population) compared to 31.5 crore migrants in 2001 (31% of the population).

- 99% of total migration was internal and immigrants (international migrants) comprised 1%.

- Internal migrant flows can be classified on the basis of origin and destination.

  ○ One kind of classification is i) rural-rural (largest – 54%), ii) rural-urban, iii) urban-rural and iv) urban-urban

  ○ Another way to classify migration is (i) intra-state, and (ii) inter-state. In 2011, intra-state movement accounted for almost 88% of all internal migration (39.6 crore persons).

  ○ As of 2011, UP (83 lakh residents) and Bihar were the largest source of inter-state migrants while Maharashtra (60 lakh people) and Delhi were the largest receiver states.

Reasons for internal migration and size of the migrant labour force:

- Overall, 8% of people moved within a state for work (21%

of male migrants and 2% of female migrants).

- Movement for work was higher among inter-state migrants – 50% of male and 5% of female interstate migrants.

- As per the Census, there were 5 crore migrant workers in 2011, which, according to the Working Group Report on Migration, underestimates the migrant worker population.

PUSH	PULL
Persecution Violence War	Safety and Stability Freedom
Poor wages Lack of jobs	Higher wages Job prospects
Crop failure and famine Pollution Natural disaster	Food availability Better environment
Limited opportunities Lack of services Family separation	Family Reunification Better quality of life Availability of services

Mapping the Migrant

The reasons why people move from villages to cities in their own states or in other states, the sectors they find employment in, how they fare in their new homes and the top migrant-exporting areas in the country

WHY PEOPLE MIGRATE
■ Male ■ Female

% of migrants moving from villages to cities

	Male	Female
Work	49.7	5.1
Study	4.1	2.1
Family	36.4	86.5
Others	9.9	6.4

% of interstate migrants

	Male	Female
Work	66.6	5
Study	1.6	0.6
Family	21.1	85.8
Others	10.7	8.6

Source: Report of the Working Group on Migration, Ministry of Housing and Urban Poverty Alleviation, January 2017

TOP MIGRANT-FRIENDLY INDIAN STATES

The Interstate Migrant Policy Index 2019, prepared by Mumbai non-profit India Migration Now, ranked seven states on the basis of equitable policies for residents and migrants in labour policies, housing, social security, health, sanitation and political participation. The index contains 63 indicators across eight policy areas

KERALA 62 — MAHARASHTRA 42 — PUNJAB 40 — HARYANA 38
TAMIL NADU 37 — GUJARAT 35 — DELHI 33

INDEX (out of 100)

WHERE MIGRANTS WORK IN CITIES
Sectoral break-up of the migrant worker as part of the total urban workforce (%)
■ Male ■ Female

Primary	Manufacturing	Public services	Construction	Traditional services	Modern services	Total
20 / 65	38 / 51	40 / 56	32 / 67	29 / 55	40 / 52	33 / 56

Source: NSS 2007-08

TOP MIGRANT EXPORTERS
54 districts account for half the male interstate outmigration in the country

UTTARAKHAND
Garhwal
Almora

UTTAR PRADESH
Etawah
Faizabad
Gonda
Basti
Gorakhpur
Deoria
Sultanpur
Azamgarh
Jaunpur
Pratapgarh
Allahabad
Varanasi
Bijnor
Muzaffarnagar
Meerut
Bulandshahr
Aligarh
Etah
Siddharthnagar
Agra
Kushinagar
Rae Bareli
Ballia
Ghazipur

BIHAR
Madhubani
Darbhanga
Siwan
Saran
Samastipur
Patna
Purba Champaran
Sitamarhi
Gopalganj
Muzaffarpur
Vaishali
Begusarai
Bhojpur
Bhagalpur
Munger
Nalanda
Rohtas
Aurangabad
Nawada
Gaya

ODISHA
Ganjam

KARNATAKA
Gulbarga

MAHARASHTRA
Jalgaon

RAJASTHAN
Pali

JHARKHAND
Chatra

WEST BENGAL
Nadia
Medinipur

Source: Ministry of Housing and Urban Poverty Alleviation, January 2017

THE MIGRANT UNIVERSE
Half of the population of Goa, Maharashtra, Kerala and Punjab is migrant; nine states have migrants accounting for over 40% of their population

Source: Census 2011; *Andhra Pradesh includes data of Telangana

State	%
Jammu and Kashmir (UT)	22
Punjab	50
Haryana	42
Rajasthan	32
Gujarat	45
Madhya Pradesh	34
Maharashtra	51
Goa	78
Karnataka	43
Kerala	53
Himachal Pradesh	39
Uttarakhand	43
Uttar Pradesh	28
Delhi	43
Odisha	37
Chhattisgarh	35
Andhra Pradesh*	45
Tamil Nadu	43
Sikkim	40
Arunachal Pradesh	46
Assam	34
Nagaland	28
Manipur	24
Mizoram	35
Tripura	35
Meghalaya	26
West Bengal	37
Bihar	26
Jharkhand	29

Issues faced by migrant labour:

- Article 19(1)(e) of the Constitution, guarantees all Indian citizens the right to reside and settle in any part of the territory of India, subject to reasonable restrictions in the interest of the general public or protection of any scheduled tribe.

- However, people migrating for work face key challenges including:

- Lack of social security and health benefits and poor implementation of minimum safety standards law,
- Lack of portability of state-provided benefits especially food provided through the public distribution system (PDS) and
- Lack of access to affordable housing and basic amenities in urban areas

Steps taken by the government with regard to migrant labour:

- **Way ahead:** Four labour codes – Code on Wages 2020, Industrial Relations Code 2020, Social Security Code 2020 and Occupational Safety, Health and Working Conditions Code 2020 – needs to be notified soon.

Steps Announced For Workers

- Migrants covered under the National Food Security Act or through any state government scheme will be provided 5 kilograms of grains and 1 kg of chana per family in a month
- A scheme under the Pradhan Mantri Awas Yojana for migrant labour or urban poor to provide ease of living at an affordable rent
- National portability of public distribution cards by March 2021

- MGNREGA work to be continued during the monsoon season as well; state governments advised to provide work to migrants through MGNREGA
- Labour law changes to be made by taking the legislative route
- A special credit facility to help 5 million street vendors with a working capital of up to 10,000 crore

Conclusion:

- In India, the Concurrent List includes the subject of labour. Therefore, it is necessary for the central and state governments to work together to develop a plan for the welfare of migrant workers.
- Before executing such a plan, an accurate estimation of migrant workers is required.

Norovirus cases detected in Kerala

- Context: The Kerala Health Department confirmed two cases of the gastrointestinal infection norovirus.

About Norovirus:

- Symptoms: Stomach and intestinal inflammation, leading to symptoms such as nausea, vomiting, diarrhoea, and stomach cramps.
- Mode of Transmission – highly contagious, contact with an infected person, consuming contaminated food or water, or touching contaminated surfaces and then touching the mouth, through the air by tiny droplets when an infected person vomits.
- The virus: Capable of surviving low temperatures, common during the winter and in colder countries, hence referred to as "winter vomiting disease".
- The severity of infection: Estimated to kill 200,000 persons globally every year, with most deaths occurring among those below the age of five years and those over the age of 65 years.
- Vaccines: Not Available
- Prevention method: Practice good hygiene.

Compulsory Tamil for All State Government Jobs

- The Tamil Nadu Assembly adopted a Bill that makes a Tamil language paper compulsory for recruitment to the State government services.
- It sought to include a fresh provision in the Tamil Nadu Government Servants (Conditions of Service) Act, 2016, to give effect to this mandate.
- It got retrospective effect from December 1, 2021.

VIII. Geography-Geographical marks

Madhya Pradesh's newest Ramsar wetland covered in invasive water Hyacinth, threatening biodiversity

Context:

- An artificial lake in MP's Shivpuri district – Sankhya Sagar, has virtually disappeared under a thick layer of an invasive aquatic plant (hyacinth), threatening the biodiversity of the water body.

- Sankhya Sagar – a Ramsar site (declared in 2022), is a wetland site designated internationally important by UNESCO.

About the lake and the invasive species:

- The lake spreads across 248 hectares (612.82 acres) and helps maintain the ecological balance of the Madhav National Park.

- The lake is home to marsh crocodiles aka 'Mugger' (Crocodylus palustris), which is a Schedule I reptilian species protected under the Indian Wildlife (Protection) Act, 1972.

- Water hyacinth (Pontederia crassipes) is an invasive plant species (macrophytes) native to South Africa.

- Although the plant has some uses (acts as a water purifier by removing heavy metals), it poses a threat to aquatic biodiversity when it covers the entire surface of a water body.

Ramsar convention/The Convention on Wetlands of International Importance:

- It is an international treaty for the conservation and wise use of wetlands.

- It is named after the Iranian city of Ramsar (on the Caspian Sea), where the treaty was signed on 2 February 1971. It came into force in 1975.

- India has 75 sites (as of August 2022) recognised under the convention.

Montreux Record:

- Montreux Record under the Convention is a register of wetland sites where changes in ecological character have occurred, are occurring, or are likely to occur as a result of technological developments, pollution or other human interference.

- It is maintained as part of the Ramsar List.

ONGC to map India's geothermal resources in search of clean energy

- Context: ONGC plans to map the geothermal energy sources of India.

- The focus on geothermal energy comes at a time when the country has set an ambitious climate target of 500 GW of installed renewable energy capacity and net zero carbon emission by 2070.

- ONGC also has accelerated its diversification efforts through its 'Energy Strategy 2040'.

About Geothermal Energy:

- Geothermal energy is an energy source that is stored in the form of heat beneath the earth's surface, which is clean, renewable, sustainable, carbon-free, continuous, uninterrupted, and environment-friendly.

- It is the only renewable energy available 24×7 to mankind not requiring storage and unaffected by day-night or seasonality variance.

- Geothermal resources in India have been mapped by the Geological Survey of India (GSI) and a broad estimate by the Ministry of New and Renewable Energy (MNRE) suggests that there could be 10 GW of geothermal power

Types of Geothermal Power Plants

- There are three types of geothermal power plants where we can harness the heat of the earth to produce electricity.

How Does Geothermal Energy Work?
1. Heat from the Earth's crust creates steam
2. Steam rotates turbine
3. Generator produces electricity
4. Water is injected back into the ground
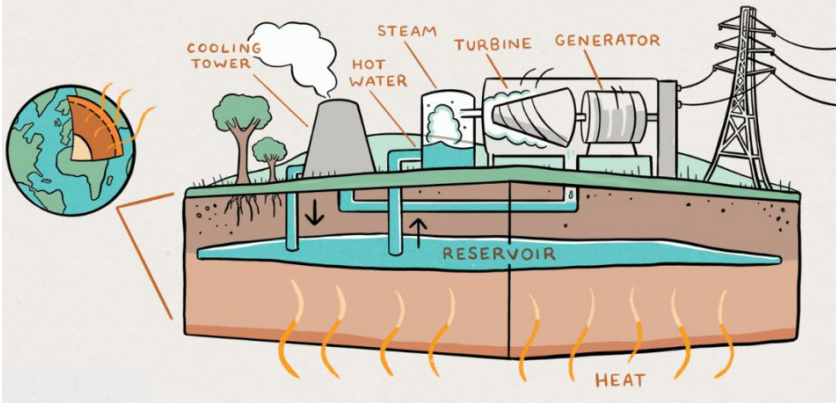
- hydrogen sulphide.
- May cause disasters – earthquakes

Status of Geothermal Energy/ Geothermal Powerplants in India

- Oil and Natural Gas Corporation (ONGC) has established India's first Geothermal field development project at Puga village in Ladakh.
- Tata Power is India's largest integrated power company. Tata Power will be setting up a

  o Dry steam power-plant
  o Flash steam power plant
  o Binary cycle power plant
- All these plants follow the same principle of using the heat of the earth to produce electricity. As flash steam power plant requires a high enthalpy range and hence they cannot be used in India.

Benefits of Geothermal Energy:

- renewable,
- provides a continuous, uninterrupted supply

Disadvantages:

- High initial capital requirement.
- Location-specific energy source, associated with other emissions like sulphur dioxide and

Geothermal provinces in India

geothermal plant in Gujarat of about 5MW plant.

- National Thermal Power Corporation is planning to construct a 300MW of geothermal power plant project in Chhattisgarh.

Why have mangroves got a Budget push?

- Context: The Union Budget for 2023-24 announced an initiative for mangrove plantation along the coastline and on salt-pan lands, under MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes).

About Mangroves:

- Mangroves are salt-tolerant plant communities found in tropical and subtropical intertidal regions. They are important refuges of coastal biodiversity and act as bio-shields against extreme climatic events.

- They are located in the intermediate zone between the land and the sea and represent one of the best examples of ecotone.

Threats to mangroves:

- Deforestation: Agriculture and aquaculture, urban development, and harvestinghave caused the loss of more than a quarter of mangrove forests.

- Land reclamation for agriculture and industrial activities has occurred in areas, which are under the Coastal Regulation Zone.

- Increasing population in coastal areas

Mangrove Ecosystem Benefits

- **Water Filteration |** 2 to 5 Hectares of Mangroves may treat the effulents of 1 hectare of aquaculture

- **Fisheries |** More than 3000 fish species are found in mangrove ecosystems

- **Climate Regulation |** Carbon stroage potential of mangroves is 3-5X higher than that of tropical upland forest

- **Livelihoods |** 120 million people live near mangroves

- **Wood |** Its density makes mangrove wood a valued source of timber and fuel

- **Coastal Protection |** Mangroves are 5 times more cost effective than grey infrastructure.

- **Mangrove Ecosystem Serivces |** Worth US$ 33,000 to 57,000 per hectare per year x 14 million hectares i.e. 800$/year

- **Tourism |** There are over 2000 mangrove related attractions globally, such as boat tours, boardwalks, kayaking & fishing.

Mangroves in India

- The 'State of World Mangroves 2022' report by the Global Mangrove Alliance puts the total mangrove cover of the world at 1,47,000 sq km (14.7 million hectares).

- India has about 4,992 sq km (0.49 million hectares) of mangroves, according to the Indian State of Forest Report (IFSR) 2021.

- Mangroves in India are distributed across nine States and three Union Territories with West Bengal having the highest mangrove cover of 2,114 sq km.

- The IFSR report also points out that there has been an increase in the mangrove cover from 4,046 sq km in 1987 to 4,992 sq km in 2021.

About MISHTI Scheme:

- MISHTI will be implemented through convergence between the MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme), CAMPA (Compensatory Afforestation Fund Management and Planning Authority) Fund, and other sources.

- Organizations that have been involved in mangrove plantations say that the initiative requires extensive work with local communities.

Discovery of lithium deposits in J&K to cut dependence on imports

- Context: Geological Survey of India (GSI) has for the first time established Lithium inferred resources of about 6 million tonnes in the Salal-Haimana area of the Reasi District of Jammu & Kashmir (UT)

- 51 Mineral Blocks including Lithium and Gold were handed over to State Governments

Significance of the find:

- Reduce the need for imports

- Improve employment opportunities
- Boost to the manufacture of rechargeable batteries
- Boost to the Economy
- Push for India's Clean Energy targets: Lithium is a key component in batteries for electric vehicles and renewable energy storage systems

Other Potential Sites in India:

- Mica belts in Rajasthan, Bihar, and Andhra Pradesh.
- Pegmatite(igneous rocks) belts in Odisha and Chhattisgarh.
- Brines of Sambhar and Pachpadrain Rajasthan, and Rann of Kachchh in Gujarat.

Status of India with respect to these critical mineral resources

- India imports almost all of its need for rare earth metals and of lithium, Cobalt (mostly from China)
- India's demand for these critical resources has risen 6 fold in the last five years as it tries to be the electronic and solar manufacturing hub
- Recently, India's first-ever Lithium deposit site was found in the igneous rocks located in the Marlagalla-Allapatna region of Southern Karnataka's Mandya district.
- The thermonuclear application makes Lithium a "Prescribed substance" under the Atomic Energy Act, of 1962 which permits AMD to the exploration of Lithium in various geological domains of the country

About Lithium:

- Lithium is a soft, silvery metal. It has the lowest density of all metals. It reacts vigorously with water.
- Greenbushes mine in Western Australiais the largest hard-rock lithium mine in the world and Australia is the global leader in Lithium production.
- Lithium is primarily extracted from brine pools ('Salar' in Chile) and rock minerals such as spodumene (in Australia)
- Countries with Largest Reserves: Chile> Australia> Argentina

Applications of Lithium:

- Batteries: Lithium is widely used in batteries due to its high electrochemical potential and low weight.
- Glass and Ceramics: Lithium is added to glass and ceramics to improve their thermal stability, transparency, and strength.
- Aerospace: Lithium is used in the production of lightweight alloys for the aerospace industry.
- Pharmaceuticals: Lithium is used in the treatment of bipolar disorder due to its ability to stabilize mood swings.
- Lubricants: Lithium is used as a lubricant in high-temperature and high-vacuum environments.
- Lithium Production in Stars: Lithium (Li) production is common among low-mass Sun-like stars during their Helium (He) core burning phase.

About GSI

- It is an attached office to the Ministry of Mines (HQ: Kolkata; set up in 1851 to find coal deposits for Railways). It is a scientific agency in India to carry out geoscientific activities.

Heat Dome

- Context: Over the past week, maximum temperatures have been 5-11 degrees C higher than normal in most parts of northern and western India.

Reasons for abnormal heat:

- According to the IMD, an anti-cyclonic formation over south Gujarat is one of the main reasons for the warming on the west coast.
- Around Maharashtra and Goa, a weaker-than-usual sea breeze along the Konkan coast was aggravating the effects of the anticyclone.
- This year is widely expected to be a little hotter than the previous two years, mainly because of the expected end of the strongest-ever La Niña event.

What are heat domes?

- A heat dome is a meteorological phenomenon that occurs when a high-pressure system traps hot air in a region, causing temperatures to rise and creating a dome of hot air.

How a heat dome forms

1 A mass of warm air builds up in still and dry summer conditions

2 High pressure in the atmosphere pushes the warm air down

3 The air is compressed and gets even hotter
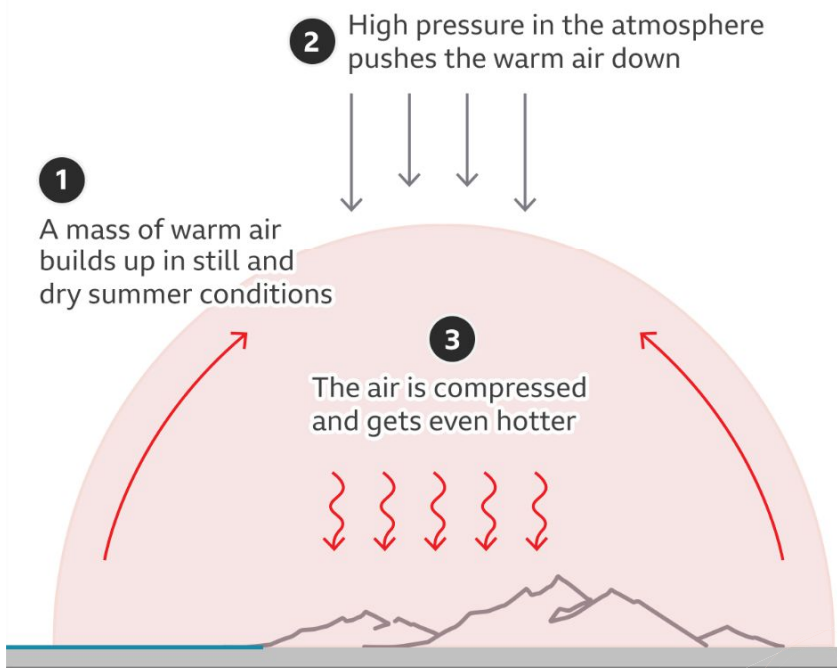
- This dome of hot air can persist for several days or weeks, leading to prolonged periods of extreme heat and heat waves.

Effects of Heat Dome:

- They are dangerous for human health, especially for vulnerable populations such as the elderly, children, and those with preexisting health conditions.
- Impacts food production
- Increasing wildfires.
- Lead to droughts and other environmental impacts
- Increased energy demand and strain on the power grid due to increased use of air conditioning.

What can be done?

- Staying hydrated, avoiding outdoor activities during the hottest parts of the day, and providing cooling centres for vulnerable populations.
- Governments and policymakers can also take steps to reduce greenhouse gas emissions and mitigate the impacts of climate change to prevent the frequency and intensity of heat domes from increasing further.

IX. Environment

Man-Elephant conflict

- The Odisha government has come up with a 'comprehensive action plan for conservation of elephants and mitigation of human-elephant conflict.
- The State has been divided into four zones.
- The Zone I will be 'Elephant Conservation Zone', which is three elephant reserves.
- The Zone II will be treated as a co-existence zone, intending to increase habitat quality and viability and reduce conflict through long-term strategies.
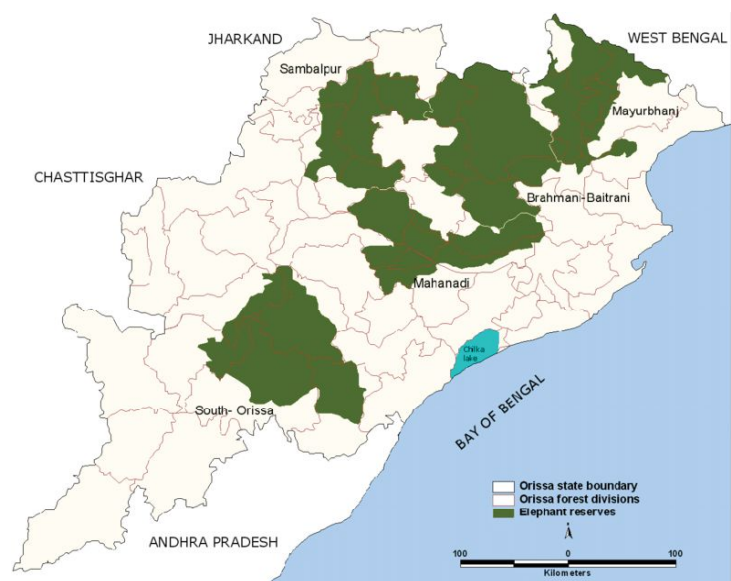
- Zone III will be a Conflict Mitigation Zone where steps will be taken to reduce conflict through short-term strategies.

- The Zone IV will be a no-go area for elephants.

- The jumbos straying in this zone to be captured and translocated forthwith to identified locations.

- In the past nine years, Odisha has lost close to 700 elephants, while the human deaths in human-elephant encounters have reached 860.

More Cheetahs transfer from South Africa

- Context: India has signed an agreement with South Africa to translocate 12 cheetahs (seven male and five female) to the Kuno Palpur National Park (KNP) in Madhya Pradesh.

Background:

- 'Cheetah' (Acinonyx Jubatus Venaticus) originates from Sanskrit and means 'the spotted one'.

- The Cheetah is the fastest land animal in the world.

- Its historical range includes the majority of Sub-Saharan Africa and extends eastward to India.

- It is the only large carnivore that went 'Extinct' in India due to overhunting and habitat loss.

- The last cheetah died in the Koriya district of present-day Chhattisgarh in 1947 and the species was declared extinct in 1952.

- According to the Wildlife Institute of India's (WII) "Action Plan for Reintroduction of Cheetah in India," 50 wild cheetahs that are ideal for starting a new cheetah population would be imported as a founder stock over five years initially.

- The PM of India released the first batch of eight cheetahs (five females and three males) from Namibia into a quarantine enclosure at Kuno last year.

- Some modifications have been made to the current bomas (wildlife cages constructed often for the treatment or quarantine of animals).

Significance of reintroducing cheetahs:

- In- situ Conservation of species.

- Beneficial to the entire eco-system ⟶ save its prey base comprising certain threatened species and endangered species of the grasslands and open forest ecosystems.

- They pose no danger to humans or large livestock.

Why is KNP given the highest priority for reintroduction?

- Suitable habitat and adequate prey base.

- Assessed to be capable of supporting 21 cheetahs.

- Devoid of human settlements: Villages have been completely relocated from within the park.

- Enables the coexistence of the four big cats found in India – the tiger, lion, leopard, and cheetah, as they have in the past.

Why are cheetahs coming from Africa?

- Asiatic cheetahs found in Iran are categorised as critically endangered.

- The highest genetic variation, which is essential for a founding population stock, is found in African cheetahs.

- African cheetahs have been determined to be the ancestors of all other Cheetah

Mass mortality of Olive Ridley turtles

- Hundreds of vulnerable Olive Ridley Turtles (Lepidochelys olivacea) have washed ashore along the coastline.

- The breeding grounds - Sakhinetipalli, Malikipuram, Mamidikuduru and Allavaram - have been witnessing the mass mortality of the turtles.

- The Olive Ridley Turtles are also known as the Pacific Ridley Turtles.

- The IUCN categorizes these turtles as "Vulnerable".

- They are found in the Indian Ocean, Atlantic, and Pacific Oceans.

- In India, the turtles' nest is in the Gahirmatha beach in Odisha.

- The beach is one of the largest nesting sites of the Olive Ridley Turtles in the world.

GREEN INDIA MISSION

- Context: According to data accessed via the RTI, India is lagging behind in the targets to increase the number and quality of tree and forest-cover plantations set in the Green India Mission (GIM).

Background:

- As per the India State of Forest Report-2021, forest and tree cover in the country increased by 2,261 square kilometres since the last assessment in 2019.

- India's total forest and tree cover was 80.9 million hectares, which accounted for 24.62% of the geographical area of the country.

- According to India's National Forest Policy (1988), at least 33% of the country's total land area should be covered by forests in order to ensure ecological stability.

- India is tenth in the world in terms of the total area covered by forests, but only 120th in terms of the proportion of that area covered by forests.

- 17 States and Union Territories had more than 33% of their area under forest cover.

- The top five States in terms of forest cover as a percentage of their total geographical area were Mizoram (84.53%), Arunachal Pradesh (79.33%), Meghalaya (76%), etc.

- MP had the largest forest cover, followed by Arunachal Pradesh,

National Action Plan on Climate Change

8 missions to address climate change concerns & promote sustainable development

National Solar Mission

National Mission on Sustainable Habitat

National Mission for Sustaining the Himalayan Ecosystem

National Mission for Enhanced Energy Efficiency

National Water Mission

National Mission on Strategic Knowledge for Climate Change

National Mission for a Green India

National Mission for Sustainable Agriculture

Chhattisgarh, Odisha and Maharashtra.

- It is one of the eight Missions under the National Action Plan on Climate Change (NAPCC) launched in 2014 for a 10 years period with an outlay of Rs 60,000 crore.

- It aims at protecting, restoring and enhancing India's forest cover and responding to climate change.

- The target under the Mission is –
  - Increasing the forest and tree cover by 5 million hectares (ha) in 10 years.
  - Increasing the quality of the existing forest and tree cover in another 5 million ha of forest in non-forest lands in 10 years.
  - Increasing forest-based livelihood income for about 3 million households in and around these forest areas.

- It is implemented under the overall administrative control of the MoEF&CC and presents a holistic approach to greening that considers –
  - Carbon sequestration goals
  - Maintain diverse ecosystem services (biodiversity, etc) and provisioning services (fuel, fodder, etc)

- Integrated cross-sectoral approach: Implemented on both public and private lands, with local communities playing a crucial part in planning, decision-making, implementation, and monitoring.

- Targets under the GIM: From 2015-16 to 2021-22, the Centre had approved a target of increasing tree/forest cover by 53,377 hectares and improving the quality of the degraded forest by 1,66,656 ha.

What are the challenges?

- The GIM is able to achieve only 8% of its plantation target. For example, tree/forest cover had increased by 26,287 hectares and forest quality improved by only 1,02,096 hectares as of December 31, 2022.
- The GIM is grossly underfunded and funds allocated remain underutilised: the Centre had allocated ₹681 crores but only ₹525 crores had been utilised.
- Afforestation was solely for the purpose of boosting tree count, rather than taking into account soil and weather conditions.
- Commercial plantations (like eucalyptus) to enhance green cover, which couldn't make up for natural forests and was vulnerable to insect infestations because they were monocultures.

Kelp forests losing unique traits due to climate change

Context:

- According to a new study, Kelp forests (large brown algae seaweeds) are declining because of climate change.

What is a Kelp Forest?

- They are underwater ecosystems formed in shallow water by the dense growth of several different species.
- Kelp can also persist at lower latitudes, aided by cool water upwelling or in deep-water refugia where they are protected by thermocline (transition layer between the warmer surface water and the cooler deep water).
- Keystone Species: They provide underwater habitats to hundreds of species and thus have great ecological & economic value.
- Provide Ecosystem Services: such as coastal protection and carbon sequestration.
- They also provide recreational and tourism value for scuba diving, snorkelling, and kayaking.
- Their loss will lead to a decline in the unique biodiversity that they support.

Findings of the study:

- Kelp populations at equatorward-range edges are most vulnerable to climate change as these locations are undergoing warming beyond thermal tolerance thresholds.
- The unique adaptive genetic diversity that the rear-edge populations (populations in warm, low-latitudes) may contain is also under threat due to rapid warming.

What is the thermal tolerance threshold?

- The ability of an organism to withstand high temperatures after prior exposure to moderate temperatures. For example, Ecklonia radiata, the dominant and most widely distributed Laminarian kelp in the southern hemisphere, rapidly succumb to warmer temperatures in spring and summer when temperatures exceed 27 degrees Celsius.
- Way ahead: Kelp forests are incredibly important ecosystems that are worth protecting and preserving for their ecological, economic, and social benefits. To ensure that genetic diversity is protected, it is essential to identify refuge areas, which are places that support a lone or extinct population of a once more common species.

	Seaweed	Seagrass
Definition	Seaweed is a macroalga	Seagrass is a marine flowering plant
Kingdom	Kingdom Protista	Kingdom Plantae
Vascular Tissue	Seaweed is a non-vascular alga	Seagrass is a vascular plant
True Stem, Root & Leaves	Lacks true stem, roots and leaves	Has a true stem, roots and leaves
Flowers	Seaweed does not produce flowers	Seagrass produces flowers
Seeds	Seaweed does not produce seeds	Seagrass produces seeds
Fruits	No fruits	Produces fruits

Coal India Ltd to Launch M-Sand Projects in a Big Way

- Context: Coal India Ltd (CIL) has envisaged processing the fragmented rock (known as Overburden Rocks (OB) for sand production in mines.
- OB material contains about 60% sandstone by volume which is harnessed through crushing and processing of Overburden.

What is M Sand?

- M sand is a form of artificial sand, manufactured by crushing large hard stones, mainly rocks or granite, into fine particles, which are then washed and finely graded. It is widely used as a substitute for river sand for construction purposes, mostly in the production of concrete and mortar mix.

Need for M Sand

- Due to high demand, regulated supply and a complete ban on sand mining during monsoon to protect the river ecosystem, finding an alternative to river sand became necessary.
- The Supreme Court banned illegal mining on riverbeds in 2017
- Sand Mining Framework (2018) prepared by the Ministry of Mines envisages alternative sources of sand in the form of Manufactured Sand (M-Sand) from crushed rock fines (crusher dust), and sand from Overburden (OB) of coal mines.
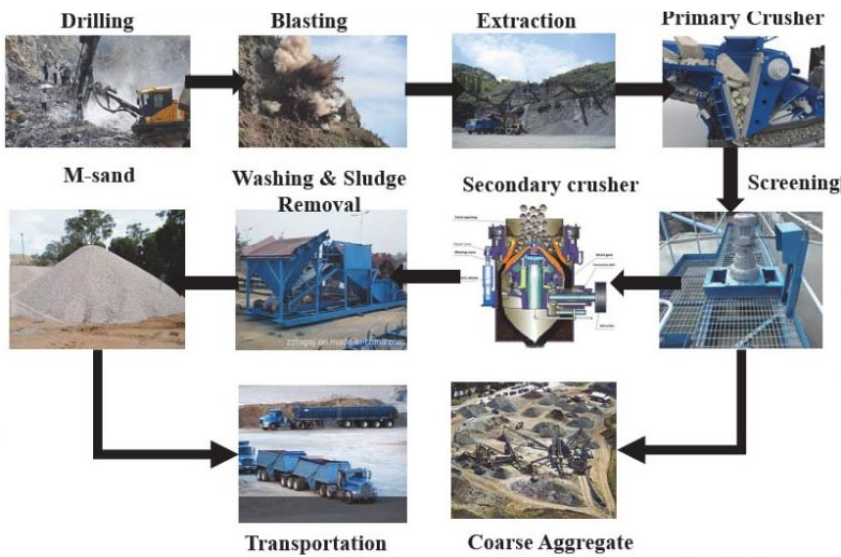
Why Coal India Ltd?

- During Opencast mining of Coal India, the overlying soil and rocks are removed as waste to extract coal and the fragmented rock (Overburden or OB) is heaped in dumps. Most of the waste is disposed of at the surface which occupies a considerable land area and requires extensive planning and control to minimize the environmental impact of mining.

Difference between M Sand and Natural River sand

Parameters	M Sand	River Sand
Process	Manufactured in a factory.	Naturally available on river banks.
Shape	Angular and has a rougher texture. Angular aggregates demand more water. Water demand can be compensated with cement content.	Smoother texture with better shape. Demands less water.
Moisture Content	Moisture is available only in water washed M Sand.	Moisture is trapped in between the particles which are good for concrete purposes.
Concrete Strength	Higher concrete strength compared to river sand used for concreting.	Lesser concrete compared to M Sand
Silt Content	Zero silt	Minimum permissible silt content is 3%. Anything more than 3% is harmful to the concrete durability.
Over Sized Materials	0%. Since it is artificially manufactured.	1 - 6% of minimum oversized materials can be expected. Like pebble stones.
Marine Products	0%	1- 2% like sea shells, tree barks etc
Eco-Friendly	Though M Sand uses natural coarse aggregates to form, it causes less damage to the environment as compared to river sand.	Harmful to the environment. Eco imbalances, reduce groundwater level and rivers water gets dried up.

Process of Extraction of M-Sand

Drilling — Blasting — Extraction — Primary Crusher

M-sand — Washing & Sludge Removal — Secondary crusher — Screening

Transportation — Coarse Aggregate

Benefits of Manufactured Sand (M-Sand):

- Cost-effectiveness: As it can be produced in large quantities at a lower cost.

- Consistency: in grain size and shape, which can be beneficial for construction projects that require a specific type of sand.

- Environmental benefits: Helps reduce the need for mining natural sand, which can have negative environmental impacts.
  - Additionally, using the overburden from coal mines can help to repurpose materials that would otherwise be considered waste.
  - Lesser Sand extraction from the river will reduce erosion of channel beds & banks and protect the water habitat
  - Help maintain the water table

- Reduced water consumption: This helps reduce the amount of water required for construction projects, as it does not require washing before use.

- Better workability: Since it's more angular and has a rougher surface, which makes it more workable for construction projects.

Concerns regarding M Sand:

- Due to its smooth and angular textures, it leads to more water and cement requirements to achieve the expected workability, thereby increase in overall costs.

- If the M Sand contains a large number of micro fine particles, it can affect the strength and workability of concrete.

About Sand:

- Sand is a mixture of small grains of rock and granular materials which is mainly defined by size, being finer than gravel and coarser than silt.

- Sand is classified as a "minor mineral", under The Mines and Minerals (Development and Regulations) Act, 1957 (MMDR Act)

- Administrative control over minor minerals vests with the State Governments

India's net-zero commitment

- Context: The Finance Minister's latest Union Budget 2023-24 has laid emphasis on the government's commitment to move towards net-zero carbon emission by 2070.

Background:

- According to the World Economic Forum (WEF), India holds the key to hitting global climate change targets given its sizeable and growing energy needs.

- With the country's population set to overtake China's sometime this year, India's appetite for energy to propel the economy is set to surge exponentially.

- The transition to green alternatives from the current reliance on fossil fuels is therefore an urgent imperative, as it creates an opportunity to launch new sectors and boost GDP.

The Union Budget 2023-24 announcements:

Green Growth:

- It is one of the 7 priorities (Saptarishi of Amrit Kaal) the

Budget. India is implementing many programmes for –

- ○ Green fuel, green energy, green farming, green mobility, green buildings, green equipment and policies for efficient use of energy across various economic sectors.

- These green growth efforts help in reducing the carbon intensity of the economy and provide for large-scale green job opportunities.

Moving Forward to Achieve the Climate Goals

- Green Credit Programme to be launched to incentivize sustainable actions

- PM-PRANAM to be launched to incentivize States/UTs to promote alternative fertilizers

- 500 new 'Waste to Wealth' plants to be established under GOBARdhan Scheme

- MISHTI to be taken up for Mangrove plantation along coastline

- Amrit Dharohar to be implemented over next 3 years for optimal usage of wetlands

- PRANAM PM Programme for Restoration, Awareness, Nourishment and Amelioration of Moth Earth MISHT: Mangrove Initiative for Shoreline Habitats and Tangible Incomes

Electric vehicle (EV):

- The availability of locally produced lithium-ion batteries has become essential, especially to reduce the cost of EVs.

- The Budget proposes –
  - ○ To exempt customs duty on the import of capital goods & machinery required to manufacture lithium-ion cells.
  - ○ The establishment of a viability gap funding mechanism to support the creation of battery energy storage systems with a capacity of 4,000 MWh.

Energy storage systems:

- Battery storage systems help to ensure that the electricity produced at peak output by wind and solar projects is stored and then supplied to match the demand.

- The Budget set aside a vital ₹8,300 crore towards a ₹20,700 crore project for building an inter-State transmission system for the evacuation and grid integration of 13 GW of renewable energy from Ladakh.

- The transmission line will help address hurdles in setting up solar capacity in the region, given its remoteness from India's main power grid.

India's initiatives to promote green growth:

Progress on Eight National Missions of the NAPCC

National Solar Mission	Solar power capacity of 61.62 GW installed by October 2022
National Mission for Enhanced Energy Efficiency	PAT Cycle-VII notified in October 2021 for energy saving target of 6.63 Million Tonnes of Oil Equivalent (MTOE)
National Mission on Sustainable Habitat	721 km of metro rail network made operational by August 2022.
	62.79 lakh individual household toilets and 6.21 lakh community and public toilets constructed by April 2022
National Mission for a Green India	₹626.96 crore for afforestation targets over an area of 2.1 lakh ha
National Water Mission	Jal Shakti Abhiyan: Catch The Rain 2022
National Mission on Strategic Knowledge for Climate Change	Created and strengthened 12 Centres of Excellence for climate change (June 2021)
National Mission for Sustaining Himalayan Ecosystems	Inter-University Consortium
	8 Major R&D Programmes initiated
National Mission for Sustainable Agriculture	Key targets for FY 2022-2023 covering 0.15 lakh ha under organic farming and 10 lakh ha under micro irrigation

Salient Features of the National Green Hydrogen Mission

Likely Outcomes by 2030	Green hydrogen production capacity of at least 5 MMT (Million Metric Tonne) per annum.
	Cumulative reduction in fossil fuel imports over 1 lakh crore and creation of over 6 lakh jobs.
	Renewable energy capacity addition of about 125 GW and abatement of nearly 50 MMT of annual GHG emissions.
Interventions	Financial incentive targeting domestic manufacturing of electrolysers and production of Green Hydrogen.
	Regions capable of supporting large scale production and/or utilisation of Hydrogen to be developed as Green Hydrogen Hubs.
Policy Framework	Development of an enabling policy framework to support establishment of Green Hydrogen ecosystem.
	Robust Standards and Regulations framework.
	Public-private partnership framework for R&D.
	Skill development programme

India's initiatives at the international stage

International Solar Alliance (ISA)	A treaty-based inter-governmental organisation working to tap the benefits of solar power and promote clean energy applications.
Coalition for Disaster Resilient Infrastructure (CRDI)	Launched by the PM of India during the UN Climate Action Summit in 2019 in New York, it is a global partnership to promote the resilience of infrastructure to climate and disaster risks.
Leadership Group for Industry Transition (LeadIT)	It gathers countries and companies that are committed to action to achieve the Paris Agreement. It was launched by the governments of Sweden and India at the UN Climate Action Summit in 2019 and is supported by the WEF.

Conclusion:

- With a vision for a Lifestyle for the Environment (LiFE), India is committed to achieving net-zero carbon emissions by 2070, catalyzing a green industrial and economic transformation.

Plan to eradicate invasive plant

- The Nodal Centre for Biological Invasions (NCBI) at the Kerala Forest Research Institute has come out with a management plan to eradicate Senna spectabilis.

- It is the exotic invasive plant that is posing a severe threat to the State's wildlife habitat.

- Senna spectabilis is a deciduous tree native to tropical areas of America.

- It grows up to 15 to 20 metres in a short period of time and distributes thousands of seeds after flowering.

- The thick foliage of the tree arrests the growth of other indigenous tree and grass species.

- Thus, it causes food shortage for the wildlife population, especially herbivores.

- It also adversely affects the germination and growth of the native species.

- It is categorised as 'Least Concern' under IUCN Red List.

Industrial aerosols contribute to global cooling

- Context: A new study found that inactive volcanoes contributed 66 percent of preindustrial era sulphate emissions, which are known to have a cooling effect on the planet. This suggests that there are more inactive or non-eruptive volcanoes emitting sulphates than previously estimated, potentially leading to inaccuracies in future climate projections

Key findings of the study:

- By studying the ice core layers, the team calculated the levels

of sulphate aerosols between 1200 and 1850. Their analysis showed inactive volcanoes release up to three times the rate of sulphate emissions than previously believed.

- Climate models do not consider hydrogen sulphide, which escapes from inactive volcanoes. These gases react with oxygen to produce sulphur dioxide within three days, forming sulphate aerosols.

- Sulphur dioxide, released from natural as well as anthropogenic sources, reacts with water vapour and other gases in the atmosphere to create sulphate aerosols. They can cool the planet by reflecting sunlight into space. They also form clouds, which also tend to have a cooling effect.

- It argues that underestimating emissions from the preindustrial era leads to overestimating the cooling effect of aerosols seen by global models.

- It is estimated that anthropogenic aerosols have nullified 60 percent of human-induced warming in the Arctic, which is warming at a rate almost four times higher than the global rate.
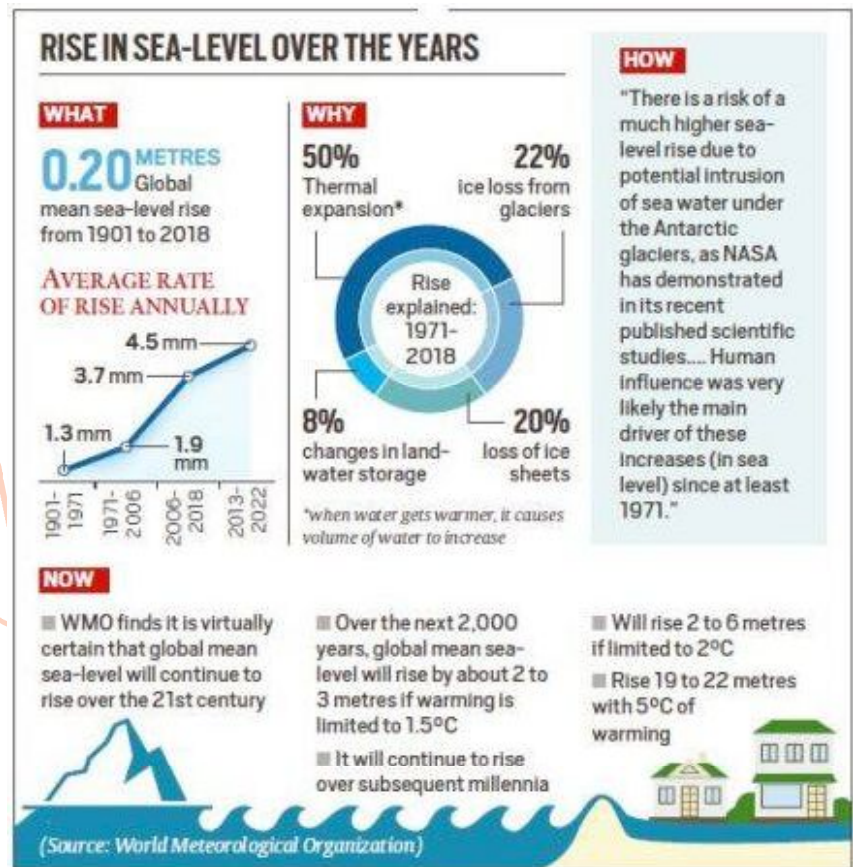
About aerosols:

- Aerosol is a system of liquid or solid particles uniformly distributed in a finely divided state through a gas, usually air.

- Aerosol particles, such as dust, play an important role in the precipitation process, providing the nuclei upon which condensation and freezing take place.

- They affect climate by reflecting or absorbing incoming solar radiation & enhancing the brightness, & thus reflectivity, of clouds.

- They also participate in chemical processes and influence the electrical properties of the atmosphere.

(Source: World Meteorological Organization)

Findings of the "Global Sea-Level Rise and Implications" report:

- Sea level rise varies regionally

- It will encroach upon Infrastructure and coastal communities will be encroached upon

- It affects a number of major cities on every continent: Shanghai, Dhaka, Bangkok, Jakarta, Mumbai, Copenhagen, New York,

Sea-level rise a major threat to India, other nations: WMO

- Context: The World Meteorological Organization (WMO) cautioned that sea level rise poses a serious threat to both China and India in a report titled "Global Sea-Level Rise and Implications."

Buenos Aires, Santiago, etc.

- Poses a significant economic, social, and humanitarian problem (threatens coastal farmlands, water reserves, the resilience of infrastructures, food-nutrition security, human lives and livelihoods), especially in vulnerable areas.

- Along with other climate con-

cerns, it will affect coastal eco-systems, related development & beyond 1 billion people by 2050

- Growing Urbanization in exposed areas will exacerbate the effects.
- It is reinforced by storm surges and tidal variations as seen during the landfall of hurricane Sandy (New York) and Cyclone Idai (Mozambique)

Reasons behind sea-level rise:

- Increase in average global temperature (by over 1°C since 1880)
- Thermal expansion of seawater (leading to mean sea level increasing by ~20 cm)
- Glacier and ice-sheet melt
- Changes in groundwater storage.

Challenges:

- According to the IPCC, melting ice sheets (the largest contributor to sea level change) are hard to predict.
- By 2150, global sea level rise is estimated to rise by roughly 4, 0.5 and 0.2 m under high, mid and low-emission scenarios, respectively.
- Limiting 21st-century global surface temperature rise to 2 °C above the pre-industrial level (Paris Agreement's target) would be insufficient.

Way ahead:

- A low greenhouse gas emission scenario, with temperatures staying below 1.5 °C
- Reaching net zero carbon emissions before 2060.
- Particularly along the coast, urban systems must enable climate-resilient development

World Meteorological Organization (WMO):

- It is an intergovernmental organisation, which originated from the International Meteorological Organisation (IMO).
- WMO was created on March 23, 1950 and it became the UN's specialized organization for fostering international co-operation on –
  ○ Meteorology (weather and climate),
  ○ Operational hydrology and
  ○ Related geophysical sciences.
- The Secretariat (headquartered in Geneva) is headed by the Secretary-General and the WMO's supreme decision-making body is the World Meteorological Congress.

First bird festival in Sundarbans

- The first-ever festival was organised by the Sundarbans Tiger Reserve (STR) division of the West Bengal Forest Department.
- The Bird Festival provides baseline data on Sundarbans' bird species diversity.
- As much as 145 different bird species were sighted during the first Bird Festival.
- The species recorded during the Bird Festival included 78 forest birds and 42 species of waders, raptors etc.
- The total number of birds spotted during the exercise was 5,065.
- The Sundarbans is located on the delta of the Ganga, Brahmaputra and Meghna rivers in the Bay of Bengal.

FIRST BIRD FEST: 5K WINGED WONDERS, 145 SPECIES

- Bird species sighted 145
- Total no. of birds spotted 5,065

SBR area	No. of species
Core	86
Buffer	128
Outside protected areas	71

Birds	No. of species
Forest birds	78
Waders/shore	42
Raptors	12
Waterfowl	6
Others	7

India, alongside China and US, set to suffer maximum climate impacts on the economy by 2050: Report

- Context: According to a report titled 'XDI's Gross Domestic Climate Risk', the Indian economy is likely to suffer alongside China and the US due to climatic impacts.

About the report:

- It has been prepared by XDI (The Cross Dependency Initiative) – an independent specialist established in 2006.
- It predicts damage to the built environment from extreme weather (flooding, forest fires) and climate change (sea level rise) and also identifies which jurisdictions see the greatest escalation of damage from 1990 to 2050.

India-specific findings:

- It shows that 14 Indian states

are set to remain within the top 100 most climate-risk-prone territories of the world by 2050.

- Bihar (followed by UP and Assam) is set to be the most climate-vulnerable region in India by 2050.

- Assam is the most vulnerable region in India in terms of the increase of climatic impacts during 1990-2050.

Global findings:

- Two of China's largest sub-national economies (Jiangsu and Shandong) are in first and second place.

- After China, the US has the most high-risk states with 18 states in the top 100, with Florida being the highest-ranking US state.

- Other globally significant economic hubs in the top 100 include Buenos Aires, Sao Paulo, Jakarta, Beijing, Ho Chi Minh City, Taiwan and Mumbai.

- Southeast Asia experiences the greatest escalation in damage from 1990 to 2050 anywhere in the world.

Significance of the report:

- This is the first physical climate risk analysis focused exclusively on the built environment, comparing every state, province and territory in the world.

- It will help investors and project developers to plan accordingly.

Way ahead:

- Scientists and experts need to get together, understand and find solutions to mitigate/adapt

to risks posed by climate change.

- There is a need to protect blue and green infrastructure as the window of opportunity according to the IPCC report is about 15-20 years.

- Conclusion: As the global temperature is expected to reach 1.5 degrees Celsius by 2050, the risk is going to compound for some of these cities ranked in the report. Therefore, sustainable development through renewable energy transition is unavoidable.

Indian blue economy is thriving but the country needs to be careful about marine litter

- Context: India has been leading the blue economy discourse at the highest level with its geographic & geostrategic position, putting greater focus on the Indian Ocean region but abandoned, lost or discarded fishing gear is a serious threat worldwide.

About Blue Economy:

- Blue economy refers to a wide range of economic activities pertaining to the sustainable development of resources and possessions in the oceans, connecting rivers, water bodies and coastal regions with a focus on equity, inclusion, innovation and modern technology.

Advantages of coastal India hold for the blue economy:

- Global producer of Fish
- Presence of Poly Metallic Nodules – PMNs

- Sea Trade – Currently 95% of India's trade volume transits by sea and the total capacity of all the Indian Ports was 2562.85 MTPA in 2021.

- Boosting Domestic and Regional Trade

Indian Initiatives:

- Promoting the spirit of 'SAGAR-Security and Growth for All in the Region' in the Indian Ocean Region.

- Sagarmala Project

- Coastal Economic Zones

- Resource exploration: India in recent times has shifted its focus toward Indian Ocean resource exploration. E.g. India has explored 75000 sq km of Indian Ocean Seabed and is developing technologies (like remotely operated vehicles) for mining the resources.

- MatsyaSampada Yojana

- International relations and security

Sustainable measures are needed to realize the blue economy potential:

- Minimizing the impact of fishing on the environment involves using sustainable fishing methods, reducing bycatch, and protecting habitats from destruction.

- Capacity development of coastal communities

- Anticipating and adapting to the impacts of climate change

- The effective implementation of the UNCLOS

X. Economy-Economy, Socio-Economic issue

1. Economy

$26 trillion economy by 2047

- India is expected to become a US$ 26 trillion GDP economy by 2047 with her per capita income reaching US$ 15,000.
- This is reported by the Global Consulting Firm, Ernst & Young's report.
- RBI and International Monetary Fund (IMF) have forecast 6.8% growth in FY23 while World Bank has pegged it at 6.9%.
- London-based IHS Markit has projected India's GDP in 2030 to reach $8.4 trillion.
- India is likely to overtake Japan as Asia's second-largest economy by 2030.
- GDP is also projected to surpass that of Germany and the UK to rank as the world's No.3.
- Currently, India is the sixth-largest economy, behind the US, China, Japan, Germany, and the UK

T+1 settlement cycle

- Context: After China, India (on SEBI's recommendation) will become the second country in the world to start the 'trade-plus-one' (T+1) settlement cycle in top-listed securities.

What is the T+1 settlement cycle?

- In simple terms, T+1 settlement means that securities transactions will reflect in the demat account after a day instead of two days now under the T+2 cycle. If an investor buys a stock on Thursday, it would be shown in the demat account on Friday.

ROAD MAP FOR INVESTORS

- Under the T + 2 system, a buyer gets the shares that he bought in his demat account, and the seller his money, on the 3rd working day (including day of trade)
- The T + 1 system will ensure stocks & money will be credited by next evening
- This is expected to boost trade volumes as both funds & shares will be available faster
- Bourses will rank all listed stocks according to mcap
- The last 100 will move to T + 1 cycle first on Feb 25
- Every last Friday of the month, the next bottom 500 stocks will be added to T + 1 list
- Newly listed stocks will have a 30-day cooling period before being added to the list
- But payment & settlement systems need to be efficient
- Trade settlement for foreign funds requires greater coordination between various market infrastructure institutions
- Retail and domestic institutions may be at an advantage over FPIs, and could quickly adopt T + 1 system
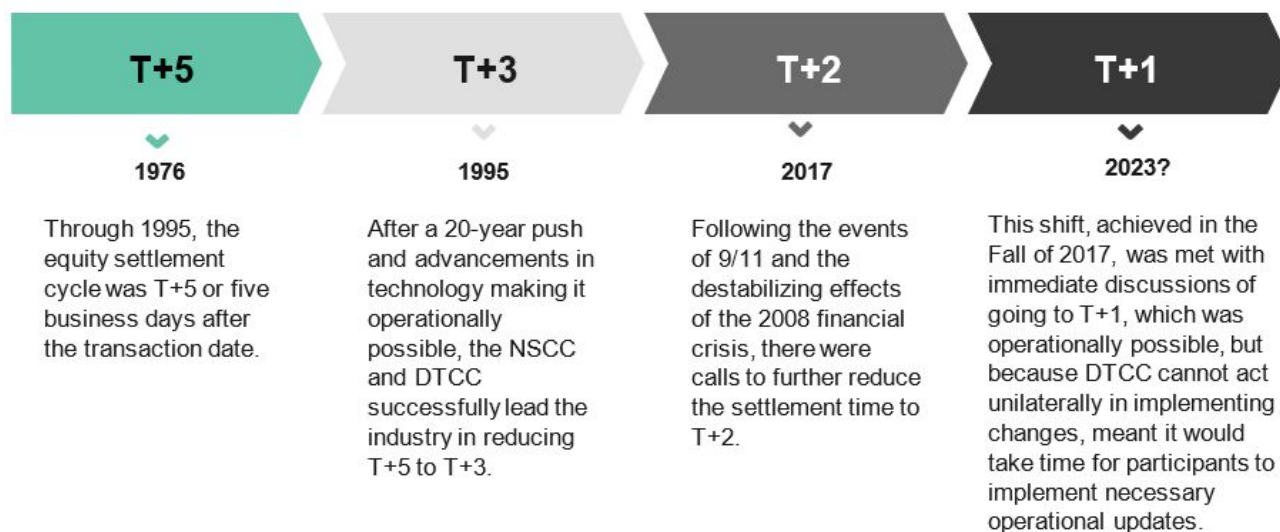
Benefits of the move:

- Brings operational efficiency
- Faster fund remittances
- Share delivery
- Ease for stock market participants
- Reduces risks and frees up capital required to collateralise the risk
- Reduces the number of outstanding unsettled trades at any point in time

Why are foreign investors opposed?

- Foreign investors operate from different geographies leading to time zone differences, information flow processes, and foreign exchange problems. Foreign investors said they would also find it difficult to hedge their net India exposure in dollar terms at the end of the day under the T+1 system.
- The United States, United Kingdom and Eurozone markets are yet to move to the T+1 system.

T+5 to T+1: Transaction Settlement in History

T+5	T+3	T+2	T+1
1976	1995	2017	2023?
Through 1995, the equity settlement cycle was T+5 or five business days after the transaction date.	After a 20-year push and advancements in technology making it operationally possible, the NSCC and DTCC successfully lead the industry in reducing T+5 to T+3.	Following the events of 9/11 and the destabilizing effects of the 2008 financial crisis, there were calls to further reduce the settlement time to T+2.	This shift, achieved in the Fall of 2017, was met with immediate discussions of going to T+1, which was operationally possible, but because DTCC cannot act unilaterally in implementing changes, meant it would take time for participants to implement necessary operational updates.

SEBI ban on Agri Commodity Trade

- Context: The farmer's union, ShetkariSanghatana, launched a protest over the Securities and Exchange Board of India's (SEBI) decision to keep the trading of derivatives in seven agricultural commodities suspended.

Background:

- In 2021, the capital markets regulator suspended futures trading in seven commodities, viz., wheat, paddy (non-basmati), moong, chana, etc., on the exchanges, in an effort to reduce food inflation.
- The ban was intended to stop speculative trade in these commodities.

How does the derivatives trade in commodities work?

- Agricultural commodities like cotton, paddy, soybean, soya oil, mustard seed, etc., are traded on the National Commodities and Derivatives Exchange (NCDEX) and the Multi Commodity Exchange (MCX).
- Derivatives are short-term financial contracts that are bought and sold in the market.
- Profits are made by predicting price movements of the asset that underlies the contract.
- The derivatives trade can be in futures and options. In a futures contract, a supplier pledges to sell a certain quantity at a fixed price at a future date.
- Also, farmers can put fixed amounts of their produce, which fits the quality standards of the exchange, to be sold at a fixed price—almost like price insurance.
- Both contracts can be terminated by either the producer or the trader by paying a margin price to the exchange.

Characteristics	Commodity Exchange	Stock Exchange
Definition	Refers to an organized market for the buying and selling of enforceable contracts to deliver commodities at a future date	Refers to a marketplace where securities such as stocks and bonds are bought and sold.
Products	Deals with future contracts of commodities	Deals with shares & other securities such as bonds
Ownership status	No ownership status achieved	The investor owns shares of a company
Investment Duration	Mainly short-term	Usually long-term
Risk	Highly risky due to the high volatility	Less risky due to stability and less volatility

Short Selling

- Context: Hindenburg Research, which has accused the Adani Group of fraud, is a short seller.

What is Short-Selling?

- Short selling, or shorting, is a trading strategy based on the expectation that the price of the security will fall. While fundamentally it is based on the "buy low, sell high" approach, the sequence of transactions is reversed in short selling — to sell high first and buy low later. Also, in short selling, the trader usually does not own the securities he sells, but merely borrows them.

- Traders in the US use short selling as speculation, and investors or portfolio managers could use it as a hedge against the downside risk of a particular stock.

Napkin Finance

Advantages	Disadvantages
Generates profits when markets fall	Returns are limited, particularly with downward locks placed in stock markets.
Helps to hedge a portfolio against risks of market falls	Can generate panic and push a trend towards market crashes.
Allow potential to earn money on low capital outlay	Short sellers lose out on dividends
Allow potential to earn money on low capital outlay	If stocks with short positions rise, investors will have to buy the shares to pay back the lender.

Methanol blended Diesel (MD15)

- Context: The government ceremonially inaugurated the demo run of an Inland Water Vessel powered by Methanol blended Diesel (MD15) (15% methanol blended HSD)

Benefits of blending gasoline with Methanol:

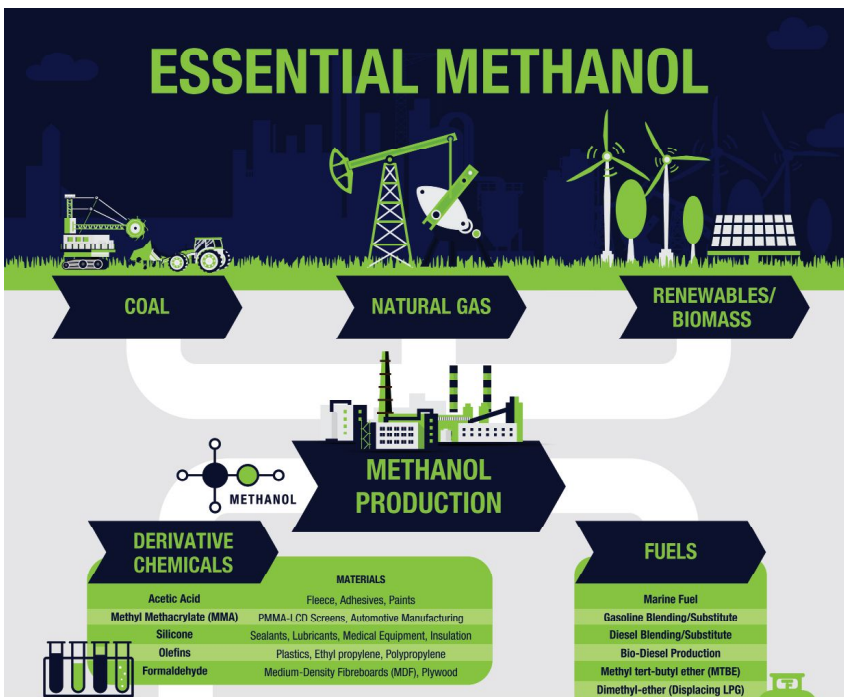- Blending 15% methanol in gasoline can result in at least a 15% reduction in the import of gasoline/crude oil. In addition, this would bring down GHG emissions by 20% in terms of particulate matter, NOx, and SOx, thereby improving urban air quality. It will also create nearly 5 million new jobs in the Methanol economy.

About Methanol Economy:

- NITI Aayog's 'Methanol Economy' programme (launched in 2018) is aimed at reducing India's oil import bill, greenhouse gas (GHG) emissions, and converting coal reserves and municipal solid waste into methanol.

About Methanol:

- Methanol is a cost-effective alternative marine fuel. It is

ESSENTIAL METHANOL

COAL | NATURAL GAS | RENEWABLES/BIOMASS

METHANOL

METHANOL PRODUCTION

DERIVATIVE CHEMICALS

	MATERIALS
Acetic Acid	Fleece, Adhesives, Paints
Methyl Methacrylate (MMA)	PMMA-LCD Screens, Automotive Manufacturing
Silicone	Sealants, Lubricants, Medical Equipment, Insulation
Olefins	Plastics, Ethyl propylene, Polypropylene
Formaldehyde	Medium-Density Fibreboards (MDF), Plywood

FUELS

Marine Fuel
Gasoline Blending/Substitute
Diesel Blending/Substitute
Bio-Diesel Production
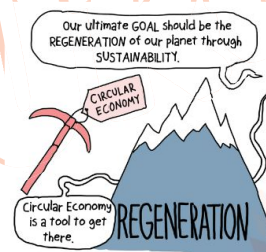Methyl tert-butyl ether (MTBE)
Dimethyl-ether (Displacing LPG)

less costly than other marine fuels and is economical in terms of developing the shoreside storage and bunkering infrastructure. It is also known as wood alcohol. Its properties are similar to ethanol. It is also used in products such as plastics, paints, and cosmetics.
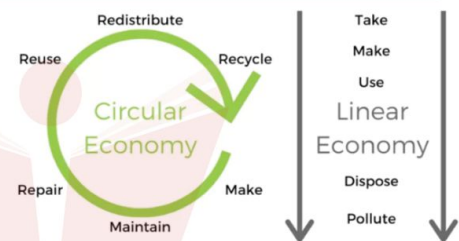
About India Energy Week:

- IEW 2023 is the first major event under India's G20 Presidency. It will be organized by the Ministry of Petroleum & Natural Gas.

- India Energy Week is the only all-encompassing international energy event supported at the highest level of the Indian government, with participation from all the Public Sector Undertakings (PSUs), and officially supported by the Federation of Indian Petroleum Industry (FIPI).

- Other initiatives for Methanol-based economy: BIS has notified 20% DME in LPG; Road ministry has notified MD15, MD85 and MD100 blends; Asia's 1st canister-based methanol cooking fuel programme (by Assam Petrochemicals in 2018); Cola-to-Methanol plants (by BHEL, Thermax and IIT Delhi)

UNDP India launches campaign to drive an inclusive circular economy

- Context: The United Nations Development Programme (UNDP) launched a campaign to drive an inclusive circular economy as part of its initiative to promote sustainability.

Key features of the campaign:

- The project is a scale-up of existing partnership under UNDP's flagship Plastic Waste Management Programme to develop a

Our ultimate GOAL should be the REGENERATION of our planet through SUSTAINABILITY.

CIRCULAR ECONOMY

Circular Economy is a tool to get there.

REGENERATION

The circular economy is a model of production and consumption, which involves sharing, reusing, repairing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended.

Circular Economy

Context: UNDP launched a campaign to drive an inclusive circular economy

Circular Economy: Redistribute, Reuse, Recycle, Repair, Maintain, Make

Linear Economy: Take, Make, Use, Dispose, Pollute

Inclusive means: The circular economy will include all the stake holders- Government, International bodies, NGOs, municipal corporations, corporates, Safai Saathis, and people

BENEFITS of a circular economy

1. Resource conservation and increased efficiency of their use
2. Reduction of environmental pressure
3. Product sales risks reduction
4. Economic growth and innovation
5. Job creation
6. New markets emergence and business opportunities
7. Reduction of economic dependence on energy and resource imports

CHALLENGES of a circular economy

1. Unevenness of circular economy benefits distribution
2. The complexity of supply chains
3. Significant capital investment required
4. Strong lobby in government and parliament from "traditional" industrial sectors
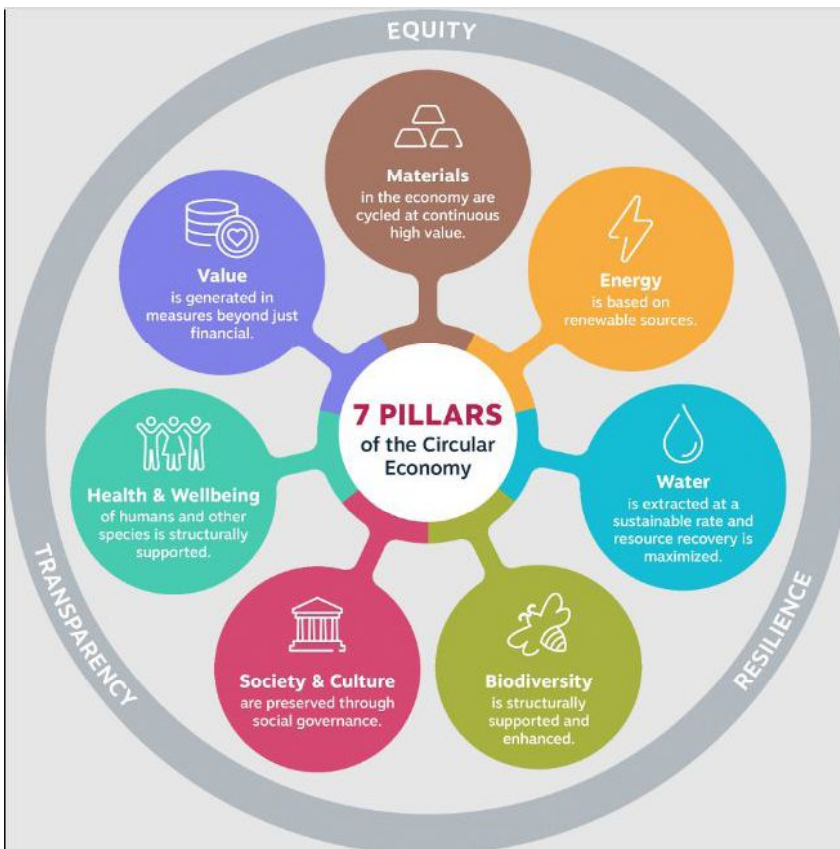5. Lack of qualified staff

sustainable model for plastic waste management in India

- End-to-end management of plastic waste by promoting:
  - Segregation of waste at the source
  - Collection of the segregated waste
  - Setting up Material Recovery Facilities (MRFs) for recycling all kinds of plastic waste
- Partnership with the Private sector:g. Hindustan Unilever Limited (HUL) will also help build the capacities of Urban Local Bodies for adopting the MRFs or Swachhata Kendra
- Collaborations: The project is a collaboration between municipal corporations, corporates, Safa-iSaathis, & people to work together for cleaner and greener cities.
- Reach out: The project will reach out to 100,000 households for segregation at the source

7 Pillars of Circular Economy:

7 PILLARS of the Circular Economy

Initiatives towards Circular Economy:

Global:

- Germany and Japan have made the 'Circular Economy' part of their economic planning
- China's Circular Economy Promotion Law

India:

- Recognition of the circular economy concept in the 2022-23 Budget
- Vehicle Scrappage Policy 2022: Private vehicles older than 20 years will be deregistered from June 1, 2024, if they fail the fitness test or their registration certificate is not renewed.
- Niti Aayog along with the EU has prepared a strategy paper on 'Resource Efficiency'
- Battery Waste Management Rules 2022
- Plastic Waste Management (Amendment) Rules 2022
- e-Waste Management Rules 2022
- Extended Producer Responsibility (EPR) certificates

Fighting The Big G

- Context: Google this week began to change the business model used in India to push its Android operating system (OS) and the Google Play Store.
- The change was triggered by the Supreme Court setting January 26 as the deadline for Google to comply with the Competition Commission of India's rulings.

The Changes made by Google:

- In the new model, instead of creating a bouquet of apps, smartphone makers can license individual apps from Google.
- Google's search engine will not necessarily be the default setting

What is the 'walled garden approach' adopted by Google:

- Android's dominance (under-walled garden approach) is based on a complex model of cross-subsidies. Google offers free services such as a search

engine and email, thereby making a huge user base. This user base is then monetised for advertising revenue. Even third-party apps cannot all wish away Google. Google controls both sides of this advertising ecosystem- the users as well as third-party app developers, making it a walled garden.

Other initiatives taken to break Google's monopoly:

- South Korea: It imposed curbs on the proprietary billing system of Google and Apple.

- EU's upcoming Digital Markets Act: It will prevent "gatekeepers" from engaging in anti-competitive behaviour. It will no longer be business as usual for the Android OS ecosystem

- Previously, the Competition Commission of India (CCI) had imposed a penalty (and upheld by the supreme court) on Alphabet-owned Google for "abusing its dominant position" in markets related to the Android mobile device ecosystem.

- The CCI stated that Google contravened competition law due to mandatory pre-installation of the entire Google Mobile Suite (GMS)and there was no option to uninstall the same.

What are anti-trust laws?

- Antitrust laws are regulations that encourage competition by limiting the market power of any particular firm. Essentially, these laws prohibit business practices that unreasonably deprive consumers of the benefits of competition, resulting in higher prices for products and services. In India, The Competition Act, 2002 regulates such activities.

About CCI

- The Competition Commission of India (CCI, constituted in 2009) is a statutory body of the Government of India responsible for enforcing the Competition Act, 2002. The Monopolies and Restrictive Trade Practices Act, 1969 (MRTP Act) was repealed and replaced by the Competition Act, 2002, on the recommendations of the Raghavan committee.

- It consists of one Chairperson and six Memberswho shall be appointed by the Central Government.

- The Competition Act, 2002 (amended in 2007) prohibits anti-competitive agreements, and abuse of dominant position by enterprises and regulates combinations (acquisition, acquiring of control and M&A), which cause or are likely to cause an appreciable adverse effect on competition within India.

Indian start-ups are looking at Reverse Flipping

- Context: Indian start-ups are exploring 'reverse flipping', or shifting their domicile back to India, with easy access to capital from private equity and venture capital, changes in rules regarding round-tripping, and the growing maturity of India's capital markets, observed the Economic Survey 2022-23.

About Flipping & Reverse Flipping:

- Flipping refers to the process of transferring the entire ownership of an Indian company to an overseas entity, accompanied by a transfer of intellectual property (IP) and all data hitherto owned by the Indian company.

- This effectively transforms an Indian company into a 100 per cent subsidiary of a foreign entity, with the founders and investors retaining the same ownership via the foreign entity, having swapped all shares.

- Reverse flipping is shifting their domicile back to India.
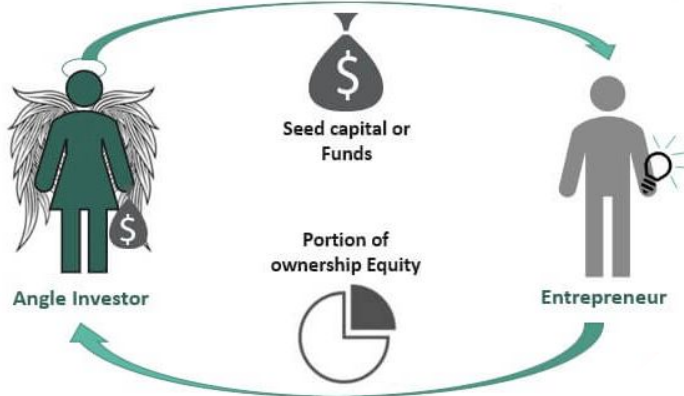
Why start-ups were flipping before:

- Challenges faced by start-ups: funding hurdles, revenue generation struggles, lack of easy access to supportive infrastructure, and a complex regulatory tax environment. Start-ups have been headquartered overseas, especially in destinations with favourable legal environments and taxation policies.

Why proposed change in Angel Tax has rattled Indian start-ups?

- Context: According to a proposal made in the Finance Bill, 2023, foreign/angel investors may be required to pay the "angel tax," which was previously only supposed to be paid for investments raised by resident Indian investors.

Angle Investors

"Angle Investors are wealthy individuals who provide capital to promising early – stage business entities usually in exchange for a portion of their equity."

Role	Pros/Cons
Angel investors primarily provide capital for startups at early stages in exchange or convertible debt or equity ownership. Angel investors often choose to get an accredited investor status (as per the SEBI AIF Regulations – an individual with a net worth of ₹7.5 crores/ whose annual income is ₹2 crores). However, an accredited investor is not necessarily an angel investor. To be an angel investor, they require having an interest in providing capital for startups.	**Pros:** Less risk than taking out a small business loan Angel investors typically have experience in investing Mentorship, guidance and valuable insights for the startup Research shows that angel investors' supported startups are more likely to have substantial growth and give a higher rate of return. **Cons:** Loss of equity, loss of control in the business Anticipate a high rate of return on their investment

What exactly is the proposed change?

- The Finance Bill 2023, has proposed to amend Section 56(2) VII B of the Income Tax Act.
- According to the clause (introduced in 2012 and commonly known as the 'angel tax'), equity investments from residents for the issuance of shares at a price above their face value are treated as income for unlisted businesses like start-ups.
  - For instance, if a start-up share has a fair market value of Rs 10 per unit and is sold to an investor for Rs 20 during a subsequent funding round, the difference of Rs 10 would be taxable as income (at 30%).
  - By subscribing to shares of a closely held company at a price over the shares' fair market value, it aims to prevent the creation and use of unaccounted money.
- However, with the latest amendment, the government has proposed to also include foreign investors in the ambit.

Why are start-ups concerned?

- According to a PwC India report, funding for India's start-ups dropped by 33% to $24 billion in 2022 as compared to the previous year.
- Foreign investors are a key source of funding for start-ups and have played a big role in increasing the valuation.
  - For instance, Tiger Global has invested in over a third of the start-ups that have turned unicorns (valuation of at least $1 billion).
- The proposed amendment will accelerate flipping overseas, as foreign investors may not want to deal with additional tax liability.

The status and proceeds of disinvestment

- The Indian government's disinvestment target for 2023-24 is ₹51,000 crore, down 21% from the previous year and the lowest target in seven years.

Status of disinvestment:

- The government has met its disinvestment targets only six times in the last three decades. The last time the government met its target was in 2018-19

- In 2021-22, the government missed its high target of ₹1.75 lakh crore by a significant margin.

- The planned privatisation of the Shipping Corporation of India, Container Corporation of India, and NMDC Steel are among the state-owned companies that will be divested in 2023-24.

- Definition: Disinvestment refers to the sale of government assets or subsidiaries.

- Need for disinvestment: The government may disinvest to reduce fiscal burden, finance the fiscal deficit, or encourage private ownership of assets.

Windfall Tax

- Context: India cuts windfall tax on crude oil to Rs 1,900 per tonne from Rs 2,100 per tonne

- India imposed the windfall profit tax, in July 2022, joining nations that tax supernormal profits of energy companies.

- Levy was introduced in view of the windfall gains made by the domestic crude producers and refiners due to high global crude and product prices (on account of the Russian-Ukraine war)

What is windfall tax?

- A windfall tax is a higher tax rate on sudden big profits levied on a particular company or industry.

ECONOMIC SURVEY 2022-23 RELEASED

- Economic Survey provides a detailed report of national economy for the year along with forecasts. It is presented a day before the presentation of Union Budget.

- It was first presented for 1950-51 and was initially part of Budget documents. In 1964-65, it was separated from budget.

- It is prepared by Economic Division of Department of Economic Affairs, Ministry of Finance under guidance of Chief Economic Advisor. Key takeaways from Economic Survey

GDP forecast	India's GDP forecast for FY24 is in a range of 6 - 6.8%, higher than most major economies.
Major global shocks	Covid19 pandemic and contraction in global output; Russia-Ukraine conflict; Sustained monetary tightening (increase in policy rates to curb inflation) by central bank.
Capital Expenditure (Capex)	Capex for FY23 was increased by 35.4% to ₹7.5 lakh crore.
FDI inflows	Declined by 14% in first half of FY23 due to global uncertainty (Russia-Ukraine conflict) but anticipated to increase in upcoming months.
Gross Non-performing Advances (GNPA)	GNPA of Scheduled Commercial Banks has fallen to a seven-year low of 5.0% in 2022 while Net NPA have dropped to a ten-year low of 1.3% of total assets
Social sector spending	Increases to Rs. 21.3 lakh crore in FY23 (budget estimate). Out-of-pocket expenditure as a percentage of total health expenditure has declined
Agriculture	Private investment in agriculture increases to 9.3% in 2020-21. Institutional Credit to Agricultural Sector continued to grow to 18.6 lakh crore in 2021-22.
Industry	Overall GVA by Industrial Sector for first half of FY23 rose 3.7%, which is higher than average growth of 2.8% achieved in first half of last decade. Electronics exports rose nearly threefold and India became the second largest mobile phone manufacturer globally.

2. Socio-Economic

LIVING WILL

- Context: A five-judge SC bench decided to modify the existing rules for "living wills" as established in its 2018 decision allowing passive euthanasia, in order to make the process of passive euthanasia easier.

- Meaning of 'Living Will': Living will is a person's right to make an advance directive about the course of his or her treatment, including the removal of life support, if such a situation arises.

Evolution of the concept of 'Living Will' in India:

- Law Commission of India (2006) in its 196th Report titled 'Medical Treatment to Terminally Ill Patients (Protection of Patients and Medical Practitioners)': A patient's decision to not receive medical treatment did not constitute an attempt to commit suicide under Section 309 IPC. Also, a doctor who obeys the instructions of a competent patient to withhold/withdraw medical treatment does not commit a breach of professional duty.

- Aruna Shanbaug case (2011): The SC allowed passive euthanasia for the nurse lying in a vegetative state at a hospital in Mumbai.

- S. Puttaswamy case/ the Right to Privacy case (2017): – Article 21 includes the concept of individual dignity and thus allows passive euthanasia.

- Common Cause case (2018): The SC decided that passive euthanasia will be legally allowed henceforth in India and also laid down guidelines for living wills.

- "We declare that an adult human being having the mental capacity to take an informed decision has the right to refuse medical treatment including withdrawal from life-saving devices. The right to die with dignity is a part of the right to live with dignity."

Meaning of active and passive euthanasia:

- Active euthanasia: involves an active intervention to end a person's life with substances or external force, such as administering a lethal injection.

- Passive or negative or non-aggressive euthanasia is the denial of medical care necessary for maintaining life, such as the denial of antibiotics when the patient is likely to die without them.

As per 2018 guidelines	This cumbersome process will now become easier
A living will was required to be signed by an individual seeking euthanasia in the presence of two witnesses.	**NO CASE IN 4 YEARS** Rule mandating that the collector would set up review med board for passive euthanasia cases done away with. Now, both primary and review boards will be constituted by the hospital
It was to be further countersigned by a Judicial Magistrate of First Class (JMFC).	Doctors in the panels need to have 5-year experience, instead of 20 years
The treating physician was to constitute a board comprising three expert medical practitioners, with at least 20 years of experience.	The requirement for the Magistrate's approval has been replaced by an intimation to the Magistrate.
If the board grants permission, the will had to be forwarded to the District Collector for his approval.	The medical board must communicate its decision within 48 hours (no time limit earlier).

The Collector then forms another medical board of three expert doctors, including the Chief District Medical Officer.	Now a notary or gazetted officer can sign the living will in the presence of two witnesses instead of the Magistrate's countersign.
Only if this second board agreed with the hospital board's findings →the decision be forwarded to the JMFC → JMFC will visit the patient and examine whether to accord approval.	In case the medical boards set up by the hospital refuses permission, it will now be open to the kin to approach the High Court which will form a fresh medical team.

Socio-economic development of the Bundelkhand region

- Context: The Steering Committee of the Ken-Betwa Link Project (KBLP), chaired by the Secretary of the Department of Water Resources, Ministry of Jal Shakti, held its third meeting in New Delhi.
- It is a "flagship" project that is critical for the water security and socio-economic development of the Bundelkhand region (of MP and UP).
- The project costs Rs 44,605 crore in 2021 to water the Bundelkhand region.
- The link will be in the form of a canal (flow through Chhatarpur, Tikamgarh and Jhansi districts) that will be fed by the new Daudhan Dam on the Ken, to be built within Panna Tiger Reserve.
- The dam will generate 103 MW of hydroelectric power and is expected to irrigate 6.3 lakh hectares of land every year.

What is the KBLP?

Concerns:

- Hydrological and ecological concerns: The 'surplus and deficit' model has little basis in science (as these could be seasonal phenomena too) and it may endanger the water security of the Panna district (Ken – a non-perennial river).
  - The project has not yet received a complete forest clearance.
  - The NGT is currently hearing a challenge to the project's environmental approval.

The legal problems:

- Approval by the National Board for Wildlife violates Section 35(6) of the Wildlife (Protection) Act 1972 – improvement and better management of wildlife.
- According to the SC, the creation of a high reservoir dam on the Ken River in the Panna National Park and Tiger Reserve for the KBLP is ultra vires to the WPA 1972.
- The destructive impact of the proposed dam on the flow of water into and outside of the Ken Gharial Sanctuary (downstream of the Panna national park) is evident.

Impact on Panna's tigers and other wildlife:

- The deep gorges of Panna will be drowned if the new dam is built.
- By 2009, there were no tigers in the Panna Tiger Reserve, necessitating an incredible effort that lasted almost a decade to reintroduce them.
- The key wildlife species that will be affected include endangered vultures, mahseer fish, and the critically endangered Gangetic gharial (Gavialis gangeticus) in the Ken Gharial Sanctuary.

MAPPING KEN-BETWA
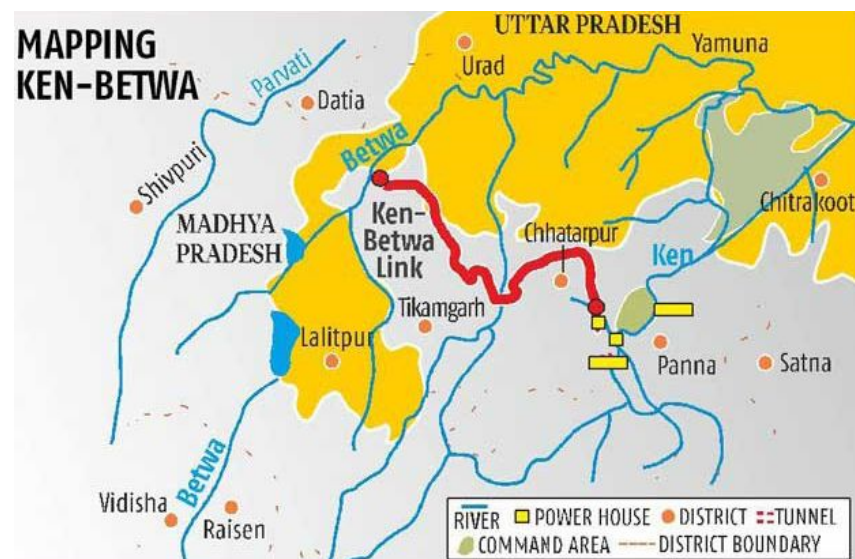
Way ahead:

- The government is developing a larger 'Panna Tiger Landscape', which should be created in any case for Panna's tigers.

- An "independent" hydrological investigation of the Ken.

- Restoring Bunderlkhand's erstwhile Chandel-period lakes and ponds.

- The developmental project should not destroy the ecology of fragile ecosystems and important tiger habitats in the country.

- The approach should be eco-centric and not anthropocentric.

- Conclusion: Due diligence and expert scrutiny during the project-approval stage are cornerstones of sound environmental governance.

Neglected Tropical Diseases Day: Poorest countries continue to be most affected, says WHO

- Context: According to the "Global report on neglected tropical diseases 2023" report published on World NTD Day — January 30, 2023, by World Health Organization (WHO), Neglected Tropical Diseases (NTD) continue to disproportionately impact the most impoverished members of the international community, living in areas with inadequate water safety, sanitation and access to health care.

About Neglected Tropical Diseases:

- NTDs are a group of 20 conditions mainly prevalent in tropical areas where people do not have access to clean water or safe ways to dispose of human waste.

- They are caused by various pathogens, including viruses, bacteria, parasites, fungi, & toxins.

- NTDs are most common among marginalized communities in the developing regions of Africa, Asia, and the Americas.

Key Findings of the report:

- 16 countries accounted for 80 per cent of the global NTD burden. Globally, nearly 1.65 billion people were estimated to require treatment for at least one NTD.

- The document also highlighted the tremendous effects COVID-19 had on community-based initiatives, access to healthcare facilities, and healthcare goods supply chains. As a result, between 2019 and 2020, 34 per cent fewer persons received treatment for NTDs.

About WHO Neglected Disease roadmap:

- The World Health Organization (WHO) works towards the ultimate goal of a world free of the burden of neglected tropical diseases (NTDs). This work is described in the NTD road map 2021–2030, WHO's blueprint to drive global efforts in the fight against NTDs in the context of the United Nations Sustainable Development Goals.

Global Initiatives:

- London Declaration on NTDs: It was adopted on 30th January

Helminth NTDs:

Taeniasis/Cysticercosis
Guinea worm disease
Echinococcosis
Foodborne trematodiases
Lymphatic filariasis
Soil-transmitted helminthiases
Schistosomiasis
Onchocerciasis

Protozoan NTDs:

Chagas Disease
Leishmaniasis
Human African Trypanosomiasis

Fungal NTDs:

Mycetoma, chromoblastomycosis and other deep mycoses

Viral NTDs:

Rabies
Dengue & Chikungunya

Bacterial NTDs:

Buruli Ulcer
Leprosy
Trachoma
Yaws

Non-infectious diseases or conditions:

Snakebite envenoming

Ectoparasitic NTDs:

Scabies and other ectoparasites

2012 to recognize the global burden of NTDs.

NTDs in India:

- India carries the largest burden of at least 11 of these diseases, with parasitic illnesses like kala-azar and lymphatic filariasis affecting millions of people throughout the country – often the poorest and most vulnerable.

Indian Initiatives to tackle NTDs:

- A WHO-supported regional alliance was established by the governments of India, Bangladesh, & Nepal in 2005 to expedite early diagnosis and treatment of the most vulnerable populations and improve disease surveillance and control of sandfly populations (Kala-azar).
- India has already eliminated several other NTDs, including guinea worm, trachoma, and yaws.

Sickle Cell Disease

- Context: Recently, the government announced in the budget the Centre's plan to launch a mission to eliminate sickle cell anaemia by 2047
- The health ministry will now screen all tribals in the country below 40 years and give them identity cards based on their sickle cell anaemia status (Unmukt Project of the central government)

- The colour-coded cards can be matched before marriage to understand the risk of sickle cell disease in the child born from the union
- Prevalence: There are approximately 200 districts in the country where the disease is prevalent, mostly in Maharashtra. Madhya Pradesh, Chattisgarh, Gujarat, Rajasthan, Jharkhand and Odisha.

About Sickle cell disease:

- Sickle cell disease is a genetic condition that affects haemoglobin - responsible for carrying oxygen in the body - in red blood cells.
- It is inherited when a child receives two genes—one from each parent—that code for abnormal haemoglobin
- It is prevalent among the tribal population in India
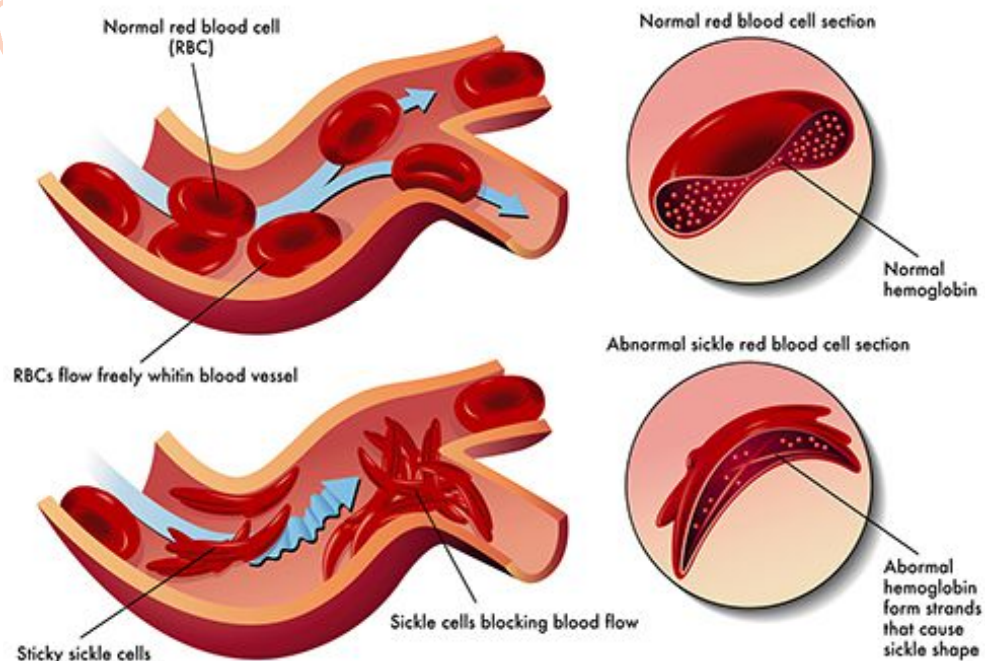- It can lead to problems such as Anaemia, debilitating acute and chronic pain, infection, acute chest syndrome, stroke, and renal failure are among the problems it can lead to.
- In sickle cell anemia, the red blood cells become rigid and sticky and are shaped like sickles or crescent moons.
- These irregularly shaped cells can get stuck in small blood vessels, which can slow or block blood flow and oxygen to parts of the body.

Initiatives by Tribal Ministry:

- Tribal Affairs Ministry established the National Council on Sickle Cell Disease and Tribal Health Cell
- The Tribal Affairs Ministry, through the development of the Sickle Cell Support Corner, has instituted a mechanism for creating a Central Repository of data.

Sickle-Cell Anemia

Normal red blood cell (RBC)

RBCs flow freely whitin blood vessel

Sticky sickle cells

Sickle cells blocking blood flow

Normal red blood cell section

Normal hemoglobin

Abnormal sickle red blood cell section

Abnormal hemoglobin form strands that cause sickle shape

XI. Science and technology

Laser beam to guide lightning

- Scientists have used a laser beam to guide lightning for the first time.
- The technique will help protect against deadly bolts-and one day maybe even trigger them.
- Lightning strikes between 40-120 times a second worldwide.
- It is killing more than 4,000 people and causing billions of dollars' worth of damage every year.
- Lightning is a discharge of static electricity that has built up in storm clouds, or between clouds and the ground.
- The laser beam creates plasma, in which charged ions and electrons heat the air.
- The air becomes "partially conductive, and therefore a path preferred by the lightning,"
- This means that, in theory, this technique could be used not just to drive lightning away, but also to help steer the strike.

BharOS

- Context: Developed by an IIT Madras-incubated startup, BharOS is being pitched as India's answer to the Google-owned Android and Apple's iOS, the two most dominant mobile operating systems in the world.

What is BharOS? How was it made?

- BharOS is an Android Open-Source Project and was developed by JandK Operations Private Limited, a non-profit organisation incubated at IIT Madras.
- Concerns existed with respect to the collection, storage, and usage of data that is generated by Indian smartphone users. BharOS tries to address these issues.

How is BharOS different from Android?

- BharOS uses AOSP or Android Open-Source Project, the functionalities & the methodologies both OS use are essentially the same.
- What sets BharOS apart from Android, is that it is free from Google Services and Apps. It comes with no default app (NDA), which allows users to have more control over permissions that an app can have.
- Google has used its preinstalled apps and services to collect data, sometimes without explicitly asking a user. Similarly, other apps from Google's Play-Store share data with third-party services. BharOS does not come with any such preinstalled services or apps, and hence, is deemed to be more secure.
- It also comes with a native over-the-air update (NOTA) feature that keeps the devices safe and with organisation-specific Private App Store Services (PASS), the device gives access to only those apps which have been thoroughly verified by the organization.

How will apps work on BharOS?

- It will let users choose what apps they want to use for their own devices.
- Furthermore, it will have its own app store which will allow users to download and install apps, eliminating the need for the Google App Store.
- Users may be allowed to side-load apps in a much easier manner than Android allows.
- Barring a few essential apps, BharOS may favour indigenously developed apps or apps that have been designed with a particular focus on India and Indian
- The indigenously-built BharOS paves the way for Atmanirbhar Bharat & could help put a check on Big Tech and the duopoly of Google-Apple in the mobile ecosystem.

Pantranscriptome

- Pantranscriptome is s combination of transcriptome and a pangenome.
- It contains genetic material from a cohort of diverse individuals, rather than just a single linear strand.
- RNA's most commonly recognized function is to translate DNA into proteins.
- But scientists now understand that the vast majority of RNA does not make proteins, but instead can play roles such as influencing cell structure or regulating genes.
- The entire RNA landscape is known collectively as the transcriptome.
- The pantranscriptome-concept builds on the emerging concept of "pangenomics" in the genomics field.
- Using a pangenome allows researchers to compare an individual's genome to that of a genetically diverse cohort of reference sequences all at once, sourced from individuals representing a diversity of biogeographic ancestry.

Doppler weather radar network

- Four Doppler weather radar systems were inaugurated in Jammu & Kashmir, Uttarakhand, and Himachal Pradesh.
- The Doppler weather radar network will cover the entire country by 2025 for more accurate forecasts related to extreme weather events.
- The government plans to establish 660 district agro-meteorological units by 2025.
- Doppler radars help in observing extent and intensity of rainfall and cloud formations, and monitoring thunderstorms and lightning in real-time.
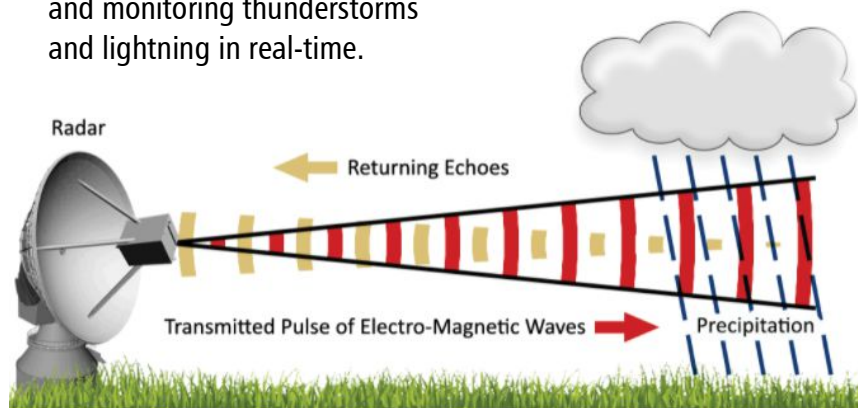
NASA's Fermi Detects First Gamma-Ray Eclipses From 'Spider' Star Systems

- Context: Scientists have discovered the first gamma-ray eclipses from a special type of binary star system using data from NASA's Fermi Gamma-ray Space Telescope.
- These so-called spider systems each contain a pulsar – the superdense, rapidly rotating remains of a star that exploded in a supernova – that slowly erodes its companion.

About Spider systems:

- Spider systems develop because one star in a binary evolves more swiftly than its partner. When the more massive star goes supernova, it leaves behind a pulsar. This stellar remnant emits beams of multiwavelength light, including gamma rays, that sweep in and out of our view, creating pulses so regular they rival the precision of atomic clocks.
- Early on, a spider pulsar "feeds" off its companion by siphoning away a stream of gas.

- As the system evolves, the feeding stops as the pulsar begins to spin more rapidly, generating particle outflows and radiation that superheat the companion's facing side and erode it.

- Scientists divide spider systems into two types named after spider species whose females sometimes eat their smaller mates. Black widows contain companions with less than 5% of the Sun's mass. Redback systems host bigger companions, both in size and mass, weighing between 10% and 50% of the Sun.

- One of the most important goals for studying spiders is to try to measure the masses of the pulsars

Rise of AMR could result in up to 10 million annual deaths by 2050: UN report

- Context: UNEP released a new report – Bracing for Superbugs: Strengthening environmental action in the One Health response to antimicrobial resistance.

- It provides evidence that the environment plays a key role in the development, transmission, and spread of Anti-Microbial Resistance (AMR).

About AMR:

- Antimicrobials are agents intended to kill or inhibit the growth of microorganisms. They include antibiotics, fungicides, antiviral agents, and parasiticides.

- AMR occurs when microorganisms such as bacteria, viruses, parasites, or fungi become resistant to antimicrobial treatments to which they were previously susceptible.

Key findings of the report:

- Up to 10 million deaths could occur annually by 2050 due to antimicrobial resistance (AMR), on par with the 2020 rate of global deaths from cancer.

- Pollution in key sectors of the economy contributes to the development, transmission, and spread of AMR.

- AMR's economic toll could result in a GDP drop of at least USD 3.4 trillion annually by 2030, pushing 24 million more people into extreme poverty

- Microorganisms (particularly bacteria) can acquire resistance following contact with resistant microorganisms.

- AMR challenges are linked to the triple planetary crisis of climate change, biodiversity loss, and pollution and waste.

- Three key sectors of AMR development and spread in the environment: Pharmaceuticals and other chemical manufacturing, agriculture and food production, and Healthcare.

Suggestions in the report:

- Create robust and coherent national-level governance, planning, regulatory and legal frameworks.

- Increase global efforts to improve integrated water management and promote water, sanitation, and hygiene to limit the

- development & spread of AMR.
- Increase integration of environmental considerations into AMR National Action Plans.
- Establish international standards for what constitutes a good microbiological indicator of AMR
- Environmental monitoring and surveillance
- AMR requires a One Health response that recognizes that the health of people, animals, plants, and the environment are closely linked and interdependent.

Artificial Synapse for Brain-Like Computing

- A team of scientists from Bengaluru's Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) have developed a low energy consuming, highspeed tech that has brain-like computing capability.
- For this, they used scandium nitride, a semiconducting material with supreme stability to develop brain-like computing.
- Traditional computers have physically separated memory storage and processing units.
- They take enormous energy and time to transfer data between these units during an operation.
- In contrast, the synapse (the junction between two neurons) in the human brain serves as both a processor and a memory storage device.
- This was making it a superior

biological computer that is both smaller and more effective.

Hydrogen train India

- Railway Minister announced that India will have its first hydrogen train ready by December this year.
- The hydrogen train will initially run on heritage circuits like Kalka to Shimla.
- Hydrogen trains, as the name suggests, run on hydrogen fuel cells.
- These are much more environmentally friendly than traditional diesel engines.
- Hydrogen fuel cells convert hydrogen and oxygen which then produces the electricity that is used to power the train's motors.
- These trains use clean energy transition fuel that does not emit any air pollutants.

How a Hydrogen Train Works

- These trains carry pure hydrogen in rooftop tanks and take oxygen from air to produce electricity in their fuel cells.
- The electrical energy is stored in batteries to power the motors because fuel cells cannot suddenly increase their output for acceleration.
- During braking, energy from the wheels is returned to the battery to increase mileage.
- Alstom's Coradia iLint trains used in Lower Saxony have a top speed of 140kmph and a maximum range of 1,000km.
- The tanks on top of each train unit carry 130kg of hydrogen

that can be filled in 15 minutes
- The UK, which intends to phase out all its diesel railway engines by 2040, is using dual-mode technology called HydroFlex (photo left).
- The trains will switch from hydrogen to catenary power wherever it is available
- France, too, has ordered dual-mode hydrogen trains from Alstom that can also run on catenary power wherever it is available
- German firm Siemens' hydrogen trains have a range of 600km and a top speed of 160kmph

ISRO successfully launches SSLV-D2

- Context: The second developmental flight of the Small Satellite Launch Vehicle (SSLV), SSLV-D2 was successfully launched from the first launch pad at Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota.
- It injected EOS-07, Janus-1, and AzaadiSAT-2 satellites into a 450 km circular orbit.

About SSLV:

- SSLV caters to the launch of up to 500 kg satellites to low earth orbits on a 'launch-on-demand' basis. It provides low-cost access to space, offers low turnaround time and flexibility in accommodating multiple satellites, and demands minimal launch infrastructure.
- It is configured with three solid propulsion stages and a velocity terminal module.

- The EOS-07 is a 156.3 kg satellite designed, developed, and realized by ISRO. New experiments include mm-Wave Humidity Sounder and Spectrum Monitoring Payload.

- Janus-1, a 10.2 kg satellite, belongs to ANTARIS, US. Janus-1 is a technology demonstrator, smart satellite mission, based on the Antaris software platform.

India's first hybrid rocket

- Context: India's first hybrid-sounding rocket by private players was launched from Tamil Nadu's Pattipulam.

About the mission:

- Martin Foundation, in association with Dr APJ Abdul Kalam International Foundation and Space Zone India, launched the Dr APJ Abdul Kalam Satellite Launch Vehicle Mission- 2023.

- The selected students designed and constructed a student satellite launch vehicle (rocket) and 150 PICO satellite research experiment cubes that contained different payloads.

- The reusable rocket was made by the selected top 100 students, while the rest made the satellites. The rocket can be used for research in weather, atmospheric conditions, and radiation.

About Hybrid Sounding rocket:

- A hybrid-sounding rocket is a type of rocket that uses a hybrid rocket engine to power its flight.

- A hybrid rocket engine uses a solid fuel grain and a liquid or gaseous oxidizer to generate thrust.

- Hybrid-sounding rockets are often used by universities, government agencies, and private companies for scientific research and testing of new technologies because of their low cost.

First waste-to-hydrogen plant

- The country's first solid waste-to-hydrogen plant will be set up in Pune.

- The plant will be built by a private company Green Billion Limited.

- It will produce 10 tons of hydrogen daily from 350 tons of solid waste.

- The fuel from waste will be used to generate hydrogen using plasma gasification technology.

INDIA'S FIRST SOLAR MISSION LIKELY TO BE LAUNCHED BY MID-2023: ISRO CHAIRMAN

- Indian Institute of Astrophysics, Bengaluru handed over the primary payload i.e., Visible Emission Line Coronograph (VELC) of Aditya L1 to ISRO for integration with other payloads.

- Aditya-L1 is first Indian space mission to observe Sun and solar corona.

- It'll be inserted in a halo orbit around Lagrangian point 1 (L1) of Sun-Earth system, which is about 1.5 million km from Earth. It'll be propelled by Polar Satellite Launch Vehicle (PSLV) XL.

- Significance of Aditya L1 Provide information to understand the problem of coronal heating, coronal mass ejection, etc.

- Observe in-situ particle and plasma environment providing data for study of particle dynamics from Sun.

- Aid in studies on drivers of space weather, and measure magnetic field of corona. Other solar missions: NASA's Parker Solar Probe, European Space Agency's Solar and Heliospheric Observatory, China's Kuafu-1 solar probe etc.

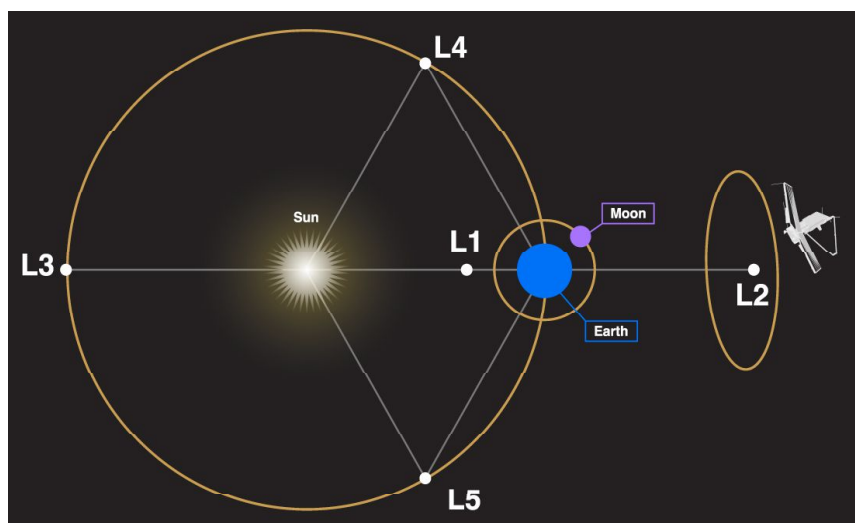| Type	S.No	Payload	Capability
Remote Sensing Payloads	1	Visible Emission Line Coronagraph (VELC)	Corona / Imaging & Spectroscopy
	2	Solar Ultraviolet Imaging Telescope (SUIT)	Photosphere and Chromosphere Imaging – Narrow & Broadband
	3	Solar Low Energy X – ray Spectrometer (SoLEXS)	Soft X – ray spectrometer : Sun – as – a – star observation
	4	High Energy L1 Orbiting X – ray Spectrometer (HEL1OS)	Hard X – ray spectrometer : Sun – as – a- star observation
In – situ Payloads	5	Aditya Solar wind Particle Experiment (ASPEX)	Solar wind / particle Analyzer Protons & Heavier Ions with directions
	6	Plasma Analyser Package For Aditya (PAPA)	Solar wind / Particle Analyzer Electrons & Heavier Ions with directions
	7	Advanced Tri – axial High Resolution Digital Magnetometers	In – situ magnetic field (Bx, By and Bz)

RESEARCHERS FIND NEW WAY TO IMPROVE STORAGE TIME OF QUANTUM INFORMATION

- Recently an international team of scientists has made a breakthrough in retaining the quantum coherence of quantum dot spin qubits

- Spin-photon interfaces are elementary building blocks for quantum networks that allow converting stationary quantum information (such as the quantum state of an ion or a solid-state spin qubit) into light (namely photons) that can be distributed over large distances.

- A major challenge is to find an interface that is both good at storing quantum information and efficient at converting it into light.

- Optically active semiconductor quantum dots are the most efficient spin-photon interface known to date but extending their storage time beyond a few microseconds has puzzled physicists in spite of decade-long research efforts.

- Recent research provides a solution to the problem that improves the storage of quantum information beyond hundred microseconds.

- Quantum dots (QDs) are a unique type of nanocrystalline semiconductor whose electronic and optical properties are dependent on the size and shape of the dots (for applications like Biomedical and Environmental Applications, Photoconductors and Photodetectors, QDs for Light-Emitting Diodes (LEDs) and Display Applications etc.).

- For spins in quantum dots, short coherence times were the biggest roadblock to applications in quantum technology.

QUANTUM COHERENCE

- Ability of a quantum state to maintain its entanglement and superposition in the face of interactions.

- It deals with the idea that all objects have wave-like properties.

- If an object's wave-like nature split in two , then two waves may coherently interfere with each other in such a way to form a single state that is a superposition of 2 states. (a qubit is a superposition of the 0 and 1 states.)

India's R&D estimates are an incomplete picture

- Context: India's R&D expenditure-GDP ratio of 0.7% is very low when compared to major economies and is much below the world average of 1.8%.

HOW INDIA SPENDS ITS R&D BUDGET

Most of the R&D expenditure incurred by the Central Government sources is channelled through these major scientific agencies
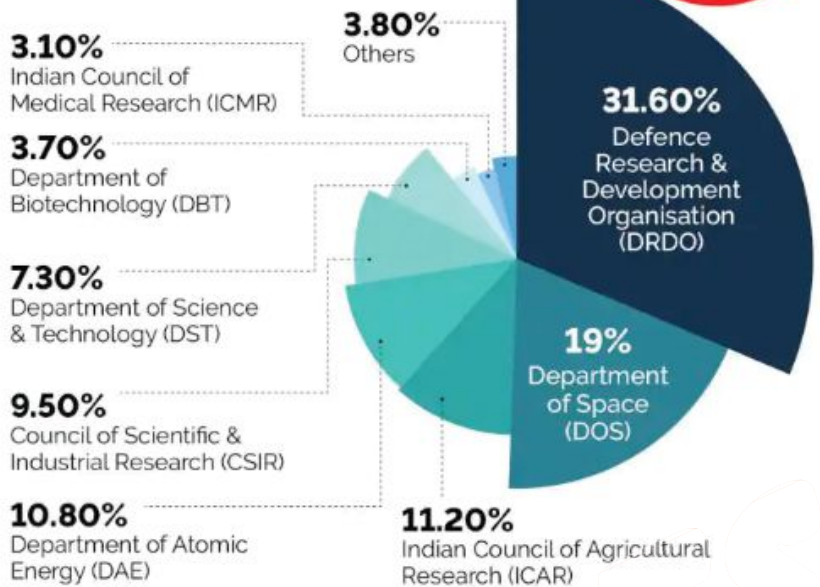
Share of R&D Expenditure by Major Scientific Agencies (2017–18)

- **3.10%** Indian Council of Medical Research (ICMR)
- **3.70%** Department of Biotechnology (DBT)
- **7.30%** Department of Science & Technology (DST)
- **9.50%** Council of Scientific & Industrial Research (CSIR)
- **10.80%** Department of Atomic Energy (DAE)
- **3.80%** Others
- **31.60%** Defence Research & Development Organisation (DRDO)
- **19%** Department of Space (DOS)
- **11.20%** Indian Council of Agricultural Research (ICAR)

Main reasons behind India's low R&D expenditure-GDP ratio:

- Low investment by the corporate sector: While the corporate sector accounts for about 2/3rd of gross domestic expenditure on R&D (GERD) in leading economies, its share in India is just 37%.
- Low investment by MNCs: For example, US-based MNCs spent $9.5 billion (₹649.7 billion) on R&D in India in 2018, which increased to $9.8 billion (₹690.2 billion) in the following year.

Issues with the current system:

- The National Science and Technology Management Information System (NSTMIS) of the DST is the agency that compiles GERD statistics in India.
- The NSTMIS relies on the Department of Scientific and Industrial Research (DSIR) list of recognised R&D units and the database of the Centre For Monitoring Indian Economy Pvt. Ltd. for this purpose.
- It is easier to gather information on R&D from the government sector, the higher education sector and public sector enterprises, but not for the private corporate sector.

Key factors making the official R&D estimates grossly inadequate:

- The DSIR list may not have many of the actual R&D performers since they may not be inclined to register themselves for two reasons:
  - They consider government incentives are not attractive enough
  - Some firms are sensitive about sharing critical information

WHY INDIA LAGS IN R&D SPENDING

One reason for the low spending on R&D in developing countries is that investments in R&D take time to produce results. According to the Niti Aayog report, in a country like India where there are bigger issues—such as hunger, disease control, and raising the quality of life—to contend with, resources are often diverted towards tackling them.

Another reason is the composition of the current R&D expenditure. The government spends the most on R&D. Low private participation is one of the key hindrances in India's overall low R&D expenditure

Source: Niti Aayog Innovation Index 2021

- Some R&D firms in services such as software find it difficult to meet the requirement of having separate infrastructure for R&D to distinguish it from their usual business.
- Some of the leading Indian enterprises in new technology areas and foreign R&D centres are not covered.
  - For example, SigTuple Technologies, which is a leading start-up in India focusing on AI-based HealthTech, is unlisted in both databases.

Way ahead for transforming India's R&D statistics:

- The NSTMIS should use the patents granted data, in addition to its current method to identify R&D-performing enterprises.
- Annual R&D estimates can be prepared from mandatory disclosures that the enterprises are required to make to the Ministry of Corporate Affairs.
- Technologies can be used like in the case of revamped IT return forms where various sections are interlinked.
- Proper disclosure of information to regulatory agencies.

Vayulink' platform

- The Indian Air Force has come out with an innovative solution that would help pilots to deal with bad weather.
- It also provides them jammer-proof uninterrupted communication with the base station.
- It is Known as 'Vayulink', the

data link communication uses the Indian Regional Navigation Satellite System (IRNSS).
- Vayulink is an ad-hoc data link communication system.
- When it was installed in an aircraft, it gives position of other aircrafts close by, encrypted traffic data over secured channel.

World's First Cloud-Built Demo Satellite

- JANUS-1 satellite that rode on Isro's new mini-rocket SSLV-D2 and reached its orbit successfully.
- It is the world's first satellite fully conceived, designed and manufactured using an Indian company's end-to-end cloud platform.
- It is a software defined 6U technology demonstration satellite designed and built using the Antaris cloud software platform and SatOSsoftware.
- JANUS-1 was designed and
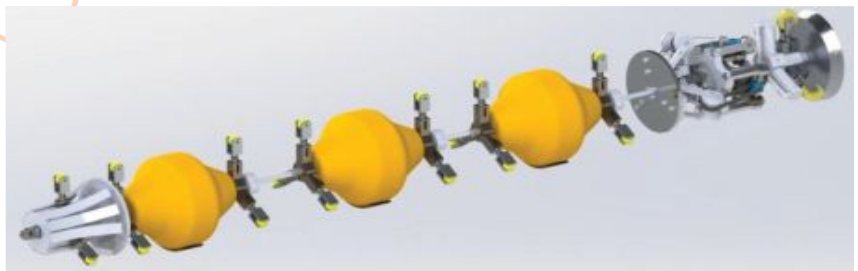
Earth's inner core

- New research published in journal nature geoscience analysed-seismeic waves from repeating earthquakes over last six decade.

Key highlights

- Innercore started rotating slightly faster than rest of the planet in early 1970s.
- It had been showing down be-

built in just 10 months at a cost saving of 75% over comparable satellite missions.

Cargo hyperloop

- IIT Kanpur has developed an energy-efficient compressed air-based pipeline system for transporting coal and minerals.
- The cargo-based hyperloop system will address challenges such as material loss, uncertainty in delivery time and air pollution.
- The system is designed to transport coal or slurry from one point to another with compressed air as its energy source.
- The robot travels at around 120 km an hour and can transport the loaded block to the designated receiving or unloading sub-section continuously.
- The system also has an accurate, reliable, and continuous vehicle/robot positioning system.

fore coming in sync with Earth's rotation around 2009.
- Negative trend i.e., inner core is now rotating slower than surface.
- Prodicted that next change would occur in mid – 2040

12 more moons of Jupiter

- 12 new moons of Jupiter have been recently discovered by American astronomers

- Jupiter occupies the first place in the solar system with maximum 92 moons
- Saturn, which was at the top with 83 moons, was relegated to the 2nd position
- The new moons were discovered in 2021 & 2022 with telescopes located in Hawaii and Chile.
- All moons are small in size ranging from 1 km to 3 km
- Small moons orbiting Saturn and Jupiter may collide with each other or collide with asteroids to form new moons.

NISAR Satellite

- The ISRO-NASA joint Nisar earth observation satellite is slated to be launched in India later this month to enable detailed monitoring of the Earth's land and snow-covered regions.
- The Indian Space Research Organization (ISRO) and the US Space Agency (NASA) have jointly developed the NASA-ISRO Synthetic Aperture Radar satellite to predict natural disasters and climate change.
- The 2800 kg satellite was manufactured at NASA's Jet Propulsion Laboratory in Washington, D.C. under a 2014 contract.

Features

- The Nisar satellite will track inch by inch changes in the Earth's land and ice cover
- The satellite will help researchers detect subtle variations in the landscape ahead of earthquake landslides & volcanic eruptions
- Thus early warning of natural calamities like the landslide in Joshimath city in Uttarakhand can be done.
- By providing measurements of ice sheet melting and ice sheet breakup, it will improve understanding of the pace and impacts of climate change, including sea level rise.
- For 3 years this satellite will monitor the entire Earth in all weather conditions every 12 days and transmit information.

SSLV-D2 Rocket

- SSLV-D2 rocket carrying Earth observation satellite EOS-07 launches from Sriharikota on Feb 10.
- A lightweight rocket project designed to launch a small satellite.

Rocket

- The Indian Space Research Organization is implementing communication, remote sensing and guidance satellite programmes.
- For that, the satellites are positioned in the sky using PSLV GSLV type rockets.
- In this, satellites weighing up to 1,750 kg can be launched by the PSLV rocket and up to 4,000 kg by the GSLV rocket.
- ISRO's newly designed SSLV rocket is small enough to carry satellites weighing up to 500 kg into low-Earth orbit.
- Its maximum weight is 120 tons.
- The EOS-07 satellite will help in coastal land use and regulation, urban-rural management, demarcation of wasteland, etc.

Google Bard

ChatGPT

- Google is set to launch Bard as a competitor to artificial intelligence platform ChatGPT.
- ChatGPT is a conversational information service powered by artificial intelligence.
- ChatGPT's ability to provide accurate answers to questions asked by users on the site has amazed everyone.
- In a short period of time it attracted many people and became hugely popular.
- Following the popularity of ChatGPT among the public, efforts are underway to integrate ChatGPT into Microsoft's search engine, Ping.
- For this, Microsoft has invested millions of dollars in OpenAI, the company that developed ChatGPT.

Sundar Pichai

- In a statement released by Sundar Pichai, Bard will be a gateway to creativity and a launch pad for curiosity.
- Difficult information about NASA's James Webb Telescope is made simple enough for a 9-year-old student to understand.

XII. Miscellaneous

1. Index

- Context: The World Economic Forum (WEF) will take into account the participation of women at the panchayat level to rank countries in its future Global Gender Gap reports.
- This will improve India's position at the global level (currently India ranks 135 Out Of 146 in the 2022 Gender Gap report)
- Previously, India had reiterated the "flaws" in the ranking system.
- The Global Gender Gap Index benchmarks the current state and evolution of gender parity across four key dimensions:
  - Economic Participation and Opportunity
  - Educational Attainment
  - Health and Survival
  - Political Empowerment

The gender score

- India ranked 135 in gender parity out of 146 countries, according to the Global Gender Gap Report 2022 released by the World Economic Forum.
- A look at India's ranking in the four sub-indexes based on which the overall ranking was determined

India	Rank 2022*
Global gender gap index	135
Economic participation and opportunity	143
Educational attainment	107
Health and survival	146
Political empowerment	48
*out of 146 countries	

About Global Gender Gap Index:

- It is the longest-standing index which tracks progress towards closing Gender gaps over time since its inception in 2006.

About WEF:

- The World Economic Forum is an international non-governmental and lobbying organisation based in Switzerland. It was founded on 24 January 1971 by German engineer and economist Klaus Schwab.

2. Report

World Employment and Social Outlook

- It was released by the International Labour Organization (ILO).
- The report projected that global employment growth will be only 1% in 2023, less than half the level in 2022.
- The global unemployment is slated to rise slightly in 2023, by around three million, to 208 million.
- The year 2022 was the witness to about 214 million workers living in extreme poverty, that is, about 6.4 per cent of the world's employed population.
- Globally, the labour force participation rate of women stood at 47.4 % in 2022, compared with 72.3% for men.
- Young people (aged 15–24) face severe difficulties in finding and keeping decent employment.
- Their unemployment rate is three times that of adults.

- More than one-in-five – 23.5%– of young people are not in employment, education or training.
- These have created the conditions for stagflation – simultaneously high inflation and low growth – for the first time since the 1970s

Nature Risk profile

- The UN Environment Programme (UNEP) and S&P Global launched the Nature Risk Profile.
- It is a new methodology for analyzing companies' impacts and dependencies on nature.
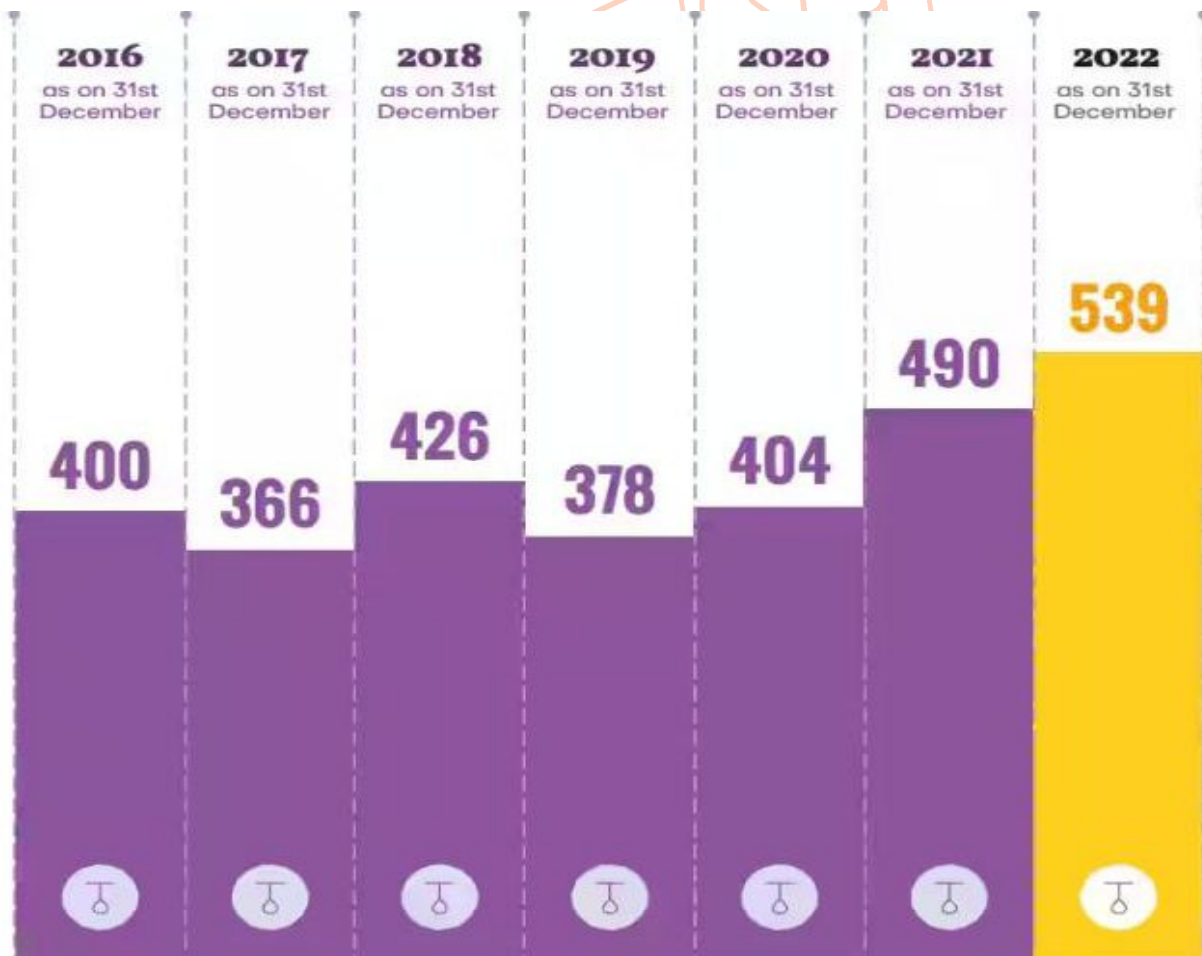- It is aimed at enabling the financial sector to measure and address nature-related risk by providing scientifically robust and actionable analytics on nature impacts and dependencies.

Annual Death Penalty Report, 2022

- In 2022, Sessions Courts in India imposed 165 death sentence penalties.
- It is the highest number in a single year in two decades.
- This rise in figure can be attributed to the "extraordinary sentencing of 38 persons to death in Ahmedabad in a single bomb blast case.
- It was representing the largest number of persons sentenced to death in a single case since 2016.
- The report went on note that as on December 31, 2022 there were 539 prisoners on the death row.
- This making it the highest-ever number since 2016 when only 400 prisoners were facing the death sentence.
- The 2022 representing a 40% increase in the population since 2015.
- This information is part of the 'Death Penalty in India: Annual Statistics 2022' report.
- It is released by Project 39A, an advocacy group with the National Law University, Delhi.

2016 as on 31st December	2017 as on 31st December	2018 as on 31st December	2019 as on 31st December	2020 as on 31st December	2021 as on 31st December	2022 as on 31st December
400	366	426	378	404	490	539

3. Minutes : (News in Shorts)

Pariksha Pe Charcha 2023: PM Modi

- On technology de-addiction: "Use technology but don't let technology use you"
  - Adopt "digital fasting" once a week
  - Create a 'no technology' zone in their homes
  - Consider yourself smarter than the gadgets
- On learning from criticism: Criticism is an integral part of India's democracy and students should learn from it to avoid getting affected by negative comments.
- On languages: Knowing a different language helps you give a sense of familiarity to the other person

Kashmir's Pashmina shawls

- Context: It is a fabric that is adored and respected all around the world as pashmina or cashmere.
- Background: The French empress Josephine, who was given a Kashmiri Kani shawl by her husband, Emperor Napoleon, in the 18th century, was instrumental in reviving a dying craft in Kashmir by popularizing it in Europe.

Pashmina:

- The term 'Pashmina' has been derived from the Persian word "Pashm" meaning wool.
- It is a GI-certified wool that has its origin in the Kashmir region of India.
- Due to the high quality of the wool used and the labour-intensive process required to make each individual piece, pashmina shawls are quite expensive.
- The Changthangi goats (Capra Hircus), domesticated in Ladakh, are the source of the wool used to weave Pashmina Shawls.
- The Changpa tribes of Ladakh who herd the Changthangi goats harvest the raw Pashm.

Shahtoosh

- It is the name given to the wool of the Tibetan chiru (Endangered in the IUCN Red List) antelopes.

Bharat Parv 2023 inaugurated at Red Fort

- Context: The six-day mega event "Bharat Parv" is being organized by the Government of India, as part of the Republic Day Celebrations.

About Bharat Parv:

- Bharat Parv was previously held from 2016 and virtually in the year 2021
- The physical event is being organized after a gap of 2 years.
- The event would have a Food Festival, Handicraft mela, folk and tribal dance performances, performances by cultural troupes, a Display of Republic Day Tableaux, illumination of Red Fort etc.
- Branding and promotion of Dekho Apna Desh, Ek Bharat Shrestha Bharat, G20 and Mission LIFE would be undertaken during the event.
- Ministry of Tourism has been designated as the nodal Ministry for the event, the highlights of which include showcasing of the best Republic Day Parade tableaux at the venue, cultural performances by the Zonal Cultural Centres as well as cultural troupes from States/ UTs, a pan – India Food Court and a pan – India Crafts Bazaar.

Significance Of Bharat Parv:

- To Promote the Spirit Of Freedom
- To celebrate independence and the history of India.
- Extension Of Republic Day Events.
- Promoting India's Food Diversity
- Promoting Vocals for Local

Genetically Engineered Trees

- Context: USA is debating whether to allow a genetically engineered (GE) version of the American chestnut tree (currently functionally extinct) to spread in the wild.
- The US has already developed and field tested the GE version, known as Darling 58, and is now awaiting clearance from government agencies to grow them in the wild.
- The population of the American chestnut, a deciduous tree native to North America, dwindled in the first half of the 20th century when a fungal blight, Cryphonectriaparasitica, killed over four billion trees.

Initiatives by other countries for GE Trees:

- China allows commercial plantation of GE Poplar Tree (insect-resistant)
- India experimenting with GE Rubber tree(extreme climatic stress-tolerant): This is made possible by inserting MnSOD gene (manganese-containing Superoxide Dimutase)

What are GE Trees?

- A genetically modified tree (GMt, GM tree, genetically engineered tree, GE tree or transgenic tree) is a tree whose DNA has been modified using genetic engineering techniques. It can help in fighting climate change by sequestering more carbon; boost biofuel production; help in growing more timber, pulp etc.
- Concerns: GE Trees may contaminate other trees along with animals; also not many scientific studies done on the long-term impact of GE trees

Aditya L1: India's first mission to study the Sun will be launched by June-July

- Context: The Aditya-L1 mission will be launched by ISRO to the L1 orbit (which is the first Lagrangian point of the Sun-Earth system)
  - Aditya-L1 is the first Indian space mission to observe the Sun and the solar corona
  - L1 orbit allows Aditya-L1 to look at the Sun continuously
  - It will be launched aboard a PSLV-XL launch vehicle

The objective of the mission:

- To study solar upper atmospheric (chromosphere and corona) dynamics and understand the physics of the solar corona and its heating mechanism.

Manipur's traditional theatre form of Shumang Leela

- Context: Shumang Leela is a traditional form of theatre in Manipur where the roles of women are all played by men, called NupiShabis.
- In the case of women's theatre groups, the roles of men are played by women.

About Shumang Leela:

- 'Shumang' means 'open courtyard'and 'Leela' means play and the literal meaning of Shumang Leela is "play of the open courtyard".
- Origin: It started as a comic genrepresented before the kings and noblemen, which ultimately developed into the present form of courtyard-enacted play.
- Values that the theatre form shows: It attempts to preserve and promote humanism, brotherhood, tolerance, confidence, devotion, truth and justice through its performances.
  - It is a powerful medium for mass educationbesides giving entertainment & relaxation.
  - It has been trying to focus on the issues of moral values, unity and integrity

Supreme Court presses the need for reform on tedious bail processes

- Context: Judge says that unless the government thinks "out

of the box" and refrains from fighting every case of bail, it could take the top court 300 to 700 years to dispose of the current backlog

What is bail?

- Bail is the temporary release of a person accused of a crime in exchange for a monetary pledge in exchange for the accused's appearance in court when the time comes.
  - The person who pays the money or undertakes a money bond acts as the surety.

Issues with the Bail processes:

- Almost every case of bail is being challenged all the way to the Supreme Court, forming more than one-third of the cases in the Supreme Court

- A huge number of under-trials: As per NCRB data over 77% of prisoners are under trial in India

- Supreme Court decided to give priority to pending bail petitions by having every Bench of the court hear 10 bail cases every day before normal work.

- In July last year (2022), a Supreme Court judgment urged the government to bring a new Act exclusively to simplify and streamline bail.

Legal aspects:

- The CrPC does not define the word bail but only categorises offences under the Indian Penal Code as 'bailable' and 'non-bailable'.

- It empowers magistrates to grant bail for bailable offences as a matter of right.

- Articles applicable: Article 20 (Protection against indiscriminate arrest); Article 21 (Protection of Life and Personal Liberty); Article 22 (Protection Against Arrest and Detention)

XR Startup Program

- Context: MeitY Startup Hub (an initiative of MeitY) and Meta (Parent company of Facebook) shortlist 120 Startups and Innovators for the XR Startup Program

- XR Startup Program (started last year) is a collaboration between MSH and Meta to discover, nurture, and accelerate Extended Reality (XR) technology startups and innovators across India.

- The XR Startup Program includes an Accelerator (for 40 early-age startups) and a Grand Challenge, aimed towards boosting the emerging tech ecosystem in the country

What is XR?

- Extended Reality (XR) is the combination of human & computer-generated graphics interaction, which is in reality as well as the virtual environment.

- In basic terms, Extended Reality is a superset of Augmented Reality (AR), Virtual Reality (VR) & Mixed Reality (MR)

Extended Reality

- **Real Life :** This is the real, physical life around us in the world (not digital).

- **Augmented Reality :** This is the technology which overlays digital information onto the real world.

- **Mixed Reality :** This is the merging of both the real world and the digital world.

- **Virtual Reality :** This is the immersing of a user in a completely digital world.

Hypersonic Technology Demonstrator Vehicle (HSTDV)

- Context: India's DRDO tested its own hypersonic technology demonstrator vehicle (HSTDV) powered by a scramjet engine.

- There is an ongoing race among China, Russia and the US to manufacture manoeuvrable hypersonic weapons that fly over five times the speed of sound and can negate missile defence systems

About DRDO:

- The Defence Research and Development Organisation (est. 1958) is the premier agency under the Department of Defence Research and Development in the Ministry of Defence, charged with the military's research and development, headquartered in Delhi, India
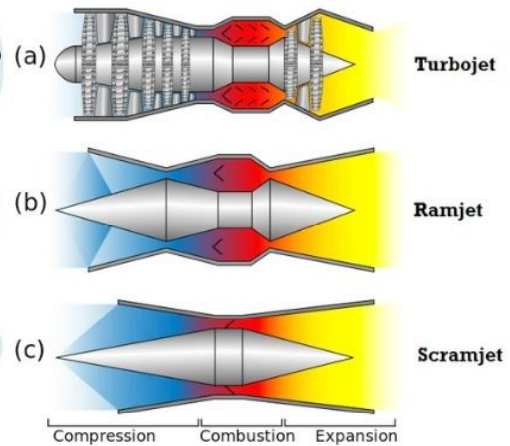
Scramjet Engine
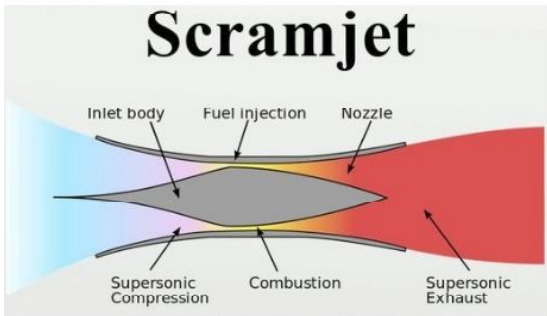
Scramjet

- A scramjet (supersonic combustion ramjet) is a variant of a ramjet airbreathing jet engine in which combustion takes place in supersonic airflow.
- Oxygen (from atmosphere) + Hydrogen (already stored in the vehicle) trigger combustion, and produce the desired thrust to lift satellite to the designated orbit.
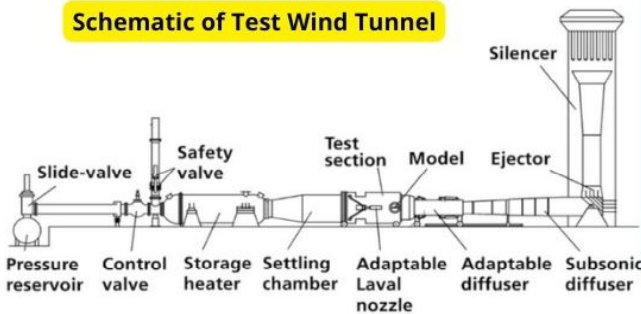- Advantage – reduce 70% of propellant that has to be carried in the vehicle.

A turbofan engine is a jet engine variant in which, a turbo (a fan) forces more air into the engine's cylinders which, added to some extra fuel, means more power can be created in the cylinder

A ramjet, or aero thermodynamic duct, is a form of airbreathing jet engine that uses the forward motion of the engine to produce thrust.

A Scramjet is advanced form of Ramjet

Trisonic Wind Tunnel

A Trisonic Wind Tunnel (TWT) is a wind tunnel so named because it is capable of testing in three speed regimes – subsonic, transonic, and supersonic.

- Wind tunnels are devices used to study the effects of airflows on solid objects (scale models of ISRO rockets and spacecrafts).
- Blow down test – Stored gases are released and blown through the tunnel's test section, simulating flight conditions.

Schematic of Test Wind Tunnel

Breast cancer: more insights on how hormonal therapy works

- Context: Recent research at Mumbai's Tata Memorial Centre has shed more light on the molecular mechanism through which progesterone treatment prior to breast cancer surgery is quite likely to increase the survival rates of patients.

What is Breast Cancer?

- Breast cancer can occur in women and rarely in men. Its treatment may consist of chemotherapy, radiation, hormone therapy and surgery.

What is Hormone Therapy for Cancer?

- Hormone therapy is a cancer treatment that slows or stops the growth of cancer that uses hormones to grow. E.g. some prostate and breast cancers.

What is Progesterone?

- Progesterone is an endogenous steroid and progestogen sex hormone involved in the menstrual cycle, pregnancy, and embryogenesis of humans and other species.

Useful extracts from PM's 97th edition of 'Mann Ki Baat' (monthly radio programme):

About E-Wastes:

- "Today's latest devices are also e-waste of the future": People have to be made aware of safe and useful methods of disposal of e-waste as it is estimated that only 15% to 17% of e-waste is recycled every year

- "Recycling waste is no less than making gold from waste": Almost 17 types of precious metals can be extracted from waste using different processes, including gold, silver, copper, and nickel

About Innovations:

- Indian Institute of Science (IISc), Bengaluru: This institution has 145 patents, which means every five days two patents are filed. This in itself is a wonderful record

- The growing scientific potential of India: For the first time in the last 11 years in India, the number of Domestic Patent Filing has been seen more than Foreign Filing.

- India ranks seventh in patent filing and in the last five years there has been an increase of nearly 50% in the global innovation index

About Inclusive initiatives:

- Purple fest (Goa): It is a unique effort towards the welfare of differently-abled people.

About Grass-root Governance:

- Uthiramerur Inscriptions (920 AD): It is notable for its descriptions of rural self-governance. They indicate that Uthiramerur had two village assemblies: Sabha and Ur.

  ○ The Sabha was an exclusively Brahmin (priestly class) assembly, while the Ur was made up of people belonging to all the classes.

- AnubhavaMantapa of Lord Basaveshwara: It is the first religious parliament in the world, whose literal meaning is "experience pavilion", and was an academy of mystics, saints and philosophers of the lingayat faith in the 12th century.

- Kakatiya Tradition (founder of the dynasty: Rudradeva I; Period 12-14th Century): Kakatiya had elected committees to look after the installation and maintenance of tanks, canals, and reservoirs

- Book "India- The Mother of Democracy": It illustrates how democratic principles were prevalent in ancient India

  ○ "Democracy is in our veins; it is in our culture – it has been an integral part of our work for centuries. By nature, we are a 'Democratic Society,'"

Rashtrapati Bhavan's Mughal Gardens was renamed Amrit Udyan

- Context: The iconic Mughal Gardens at the Rashtrapati Bhavan (President's House) in Delhi have been renamed as 'Amrit Udyan'

History of the Garden:

- At the time of the shifting of the Indian capital from Calcutta to Delhi (in 1911), about 4,000 acres of land were acquired to construct the Viceroy's House and a Mughal-style Garden. Sir Edwin Lutyens was given the task of designing the building on Raisina Hill. Lutyens' designs combined elements of classical European architecture with Indian styles.

Persian Char Bagh style

- The Mughals (1526-1858) were known to appreciate gardens e.g., Babur (in Babur Nama) says that his favourite kind of garden is the Persian char Bagh style (literally, four gardens).

- Charbagh is a Persian-style garden layout, in which the main building is put at the centre of a quadrilateral garden, divided by walkways or flowing water into four smaller parts.

  ○ This style was brought to India by the Mughals

- Humayun's tomb, Nishat Bagh (Sri Nagar) and Taj Mahal are the most famous examples of this style.

- The char Bagh structure was intended to create a representation of heaven- in which humans co-exist in perfect harmony with all elements of nature

- An important feature of these

gardens is the use of waterways to demarcate the various quadrants of the garden.

- Fountains were often built, symbolising the "cycle of life."

In a first, Indian Oil Corporation starts exporting aviation gasoline

- Context: Indian Oil Corporation (IOC) has started the exports of aviation gasoline (for the 1st time by India)
- It is used to operate unmanned aerial vehicles (UAVs) and small planes
- The beginning of fuel exports marks the entry of India into an estimated $2.7 billion global market
- Currently, the IOC is the sole manufacturer of fuel in India

What is Aviation Gasoline Fuel?

- Aviation gasoline is a high-octane aviation fuel with superior performance & quality standards compared to imported fuels.
- Usually, flying schools use this fuel for piston-engine aircraft.

Significance:

- Saving on Importing cost
- Indigenous production: The gas named AV gas 100 LL will make training in domestic flying schools economical for budding pilots,
- Advantages in modern warfare: Unmanned Aerial Vehicles (UAVs) are increasingly being used in modern warfare, including in Russia-Ukraine.

Aviation gasoline fuel (AVGAS) vs Aviation turbine fuel (ATF)?

- Aviation gasoline is used for piston-engine aircraft. These types of aircraft fly through the rotation of the propellers which generate the thrust. While Jet Fuel is used for aircraft with turbine-engine jets. These fly with the thrust of expelled air.

e-Gram SWARAJ Portal

- Context: Ministry of Panchayati Raj organized Manthan: Charting New Paths, an Industry consultation on e-Gram SWARAJ 2.0

Objectives:

- To support the 'Minimum Government, Maximum Governance' vision at the third tier of Government by the means of technology
- Longevity of social, economic, and environmental welfare at the grassroots level by enhancing rural governance through the adoption of Digital tools and Technology
- To bring in better transparency and strength of the e-Governance in Panchayati Raj Institutions (PRIs) across the country through decentralized planning, progress reporting, and work-based accounting.

About e-Gram SWARAJ Portal:

- As a part of Panchayat Enterprise Suite (PES) under the e-Panchayat Mission Mode Project (MMP), the portal aims at capacity building of its functionaries using technological interventions.

Visakhapatnam to be Andhra Pradesh's new capital

- Context: Andhra Pradesh government has announced that Visakhapatnam would become the capital of the state soon, even as the matter of developing Amaravati as the capital of Andhra Pradesh lies pending in the Supreme Court.

The background of the issue:

- In 2019, Jagan Mohan Reddy first proposed the idea of "decentralized development" and advocated for the establishment of three capitals in the state- Amaravati (Legislative capital); Visakhapatnam (Executive Capital), and Kurnool (Judicial Capital).
- However, the state government later changed its views in 2021.
- In March 2022, Andhra Pradesh High Court directed the state government to develop the proposed capital Amaravati.
- Andhra Pradesh government challenged the High Court's order in the Supreme Court. The SC stayed the HC order and the matter is in SC currently.
- The Andhra Pradesh Reorganisation Act of 2014 (Telangana Act, on 2nd June 2014) bifurcated the state of Andhra Pradesh into Telangana and the residuary Andhra Pradesh state,

as an outcome of the Telangana movement.

- Sivaramakrishnan committee constituted by the Union Government to suggest the place to build the capital city of Andhra Pradesh submitted its report on 27 August 2014 to Home Minister Rajnath Singh in New Delhi.

- This committee had also opposed creating a Single 'Super Capita' like Amaravati

- Insta curious: 13 countries in the world have more than 1 capital. Example – South Africa

Researchers find a new way to improve the storage time of quantum information

- Context: An international team of scientists has made a breakthrough in retaining the quantum coherence of quantum dot spin qubits

- The research has improved the storage of quantum information beyond hundreds of microseconds.

The issues with quantum coherence:

- Quantum coherence refers to the ability of a quantum state to maintain its entanglement and superposition in the face of interactions.
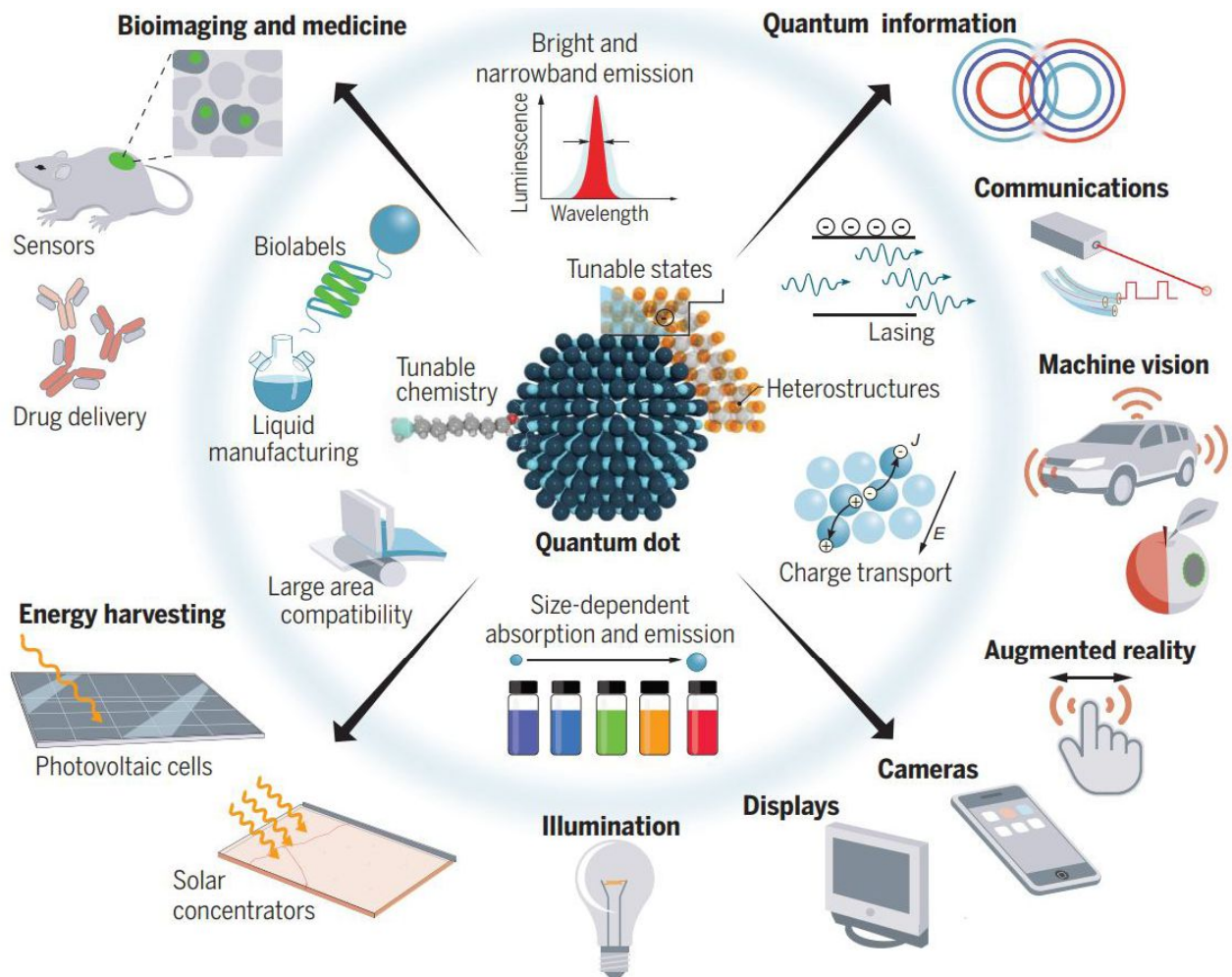
Semiconductor quantum dot technologies. QDs feature widely tunable optical, electrical, chemical, and physical properties. Their applications span energy harvesting, illumination, displays, cameras, sensors, communication and information technology, biology, and medicine. These nanostructures have been exploited to realize efficient lasers, displays, biotags, and solar harvesting devices available in the market and are emerging in photovoltaics, sensing, and quantum information.

- Quantum dots are needed for the storage of information and for its transmission to longer distances. Spin-photon allows it to do so. However, extending its storage time beyond a few microseconds has puzzled physicists.

Significance of the breakthrough:

- It will enable practical quantum networks and quantum computers
- The technologies will alter a wide range of enterprises and research initiatives, from information security to the search for novel materials and chemicals, to measurements of sensors

What are Quantum dots?

- Quantum dots are tiny particles or nanocrystals of a semiconducting material with diameters in the range of 2-10 nanometers (10-50 atoms). They are used for LEDs, displays, and various other applications

What is Quantum technology?

- Until the early 20th century, it was thought that classical physics – two objects cannot occupy the same space at the same moment. However, the principles of quantum mechanics allow it, and quantum technologies are based on it. It is exhibited by microscopic particles (photons, electrons, atoms, etc).

The principles behind quantum technology:

SUPERPOSITION

- Superposition describes a particle's ability to exist across many possible states at the same time. So the state of a particle is best described as a "superposition" of all those possible states.

ENTANGLEMENT

- Quantum entanglement refers to a situation in which two or more particles are linked in such a way that it is impossible for them to be described independently even if separated by a large distance.

OBSERVATION

- Superposition and entanglement only exist as long as quantum particles are not observed or measured. "Observing" the quantum state yields information but results in the collapse of the system.
- India's effort in the field of quantum computing: National Mission on Quantum Technology (2021); the Indian army opened a quantum research facility in Madhya Pradesh.

Bal Mitra

- Context: Delhi Commission for Protection of Child Rights (DCPCR) launched 'Bal Mitra', a WhatsApp Chatbot to provide communication support to children and parents in Delhi.

It will include:

- Complaint registration
- Searching for information and tracking complaint status
- Seeking information on admissions
- Providing authentic information on various matters related to children and their rights
- Usage: This initiative can be used as an example for showing "how technology can help in securing child's rights and creating awareness". It can also be used as an example of e-governance initiatives.

Primary Agricultural Credit Societies (PACS)

- Context: A MoU was signed between the Ministry of Cooperation, Ministry of Electronics and Information Technology, NABARD and CSC e-Governance Services India Limited, for PACS to soon start providing services like the one offered by Common Service Centres (CSC).

Significance:

- PACS are the soul of cooperatives and will enable 'Sahkar Se Samridhi'for rural development
- Making PACS multipurpose as providers of about 20 services will increase employment opportunities in rural areas.
- 50 per cent of the country's population is associated with cooperatives in one way or the other

What are PACS?

- It is a village-level institution that works directly with rural residents. It encourages agriculturists to save, accepts deposits from them, makes loans to de-

serving borrowers, and collects repayments.

- ○ There are around 63,000 Primary Agricultural Credit Societies.
- ○ The recent Budget (2023-24) has made a provision to make 2 lakh PACS in the next 5 years and create a multi-purpose PACS in every Panchayat.
- ○ PACS are the lowest unit in a three-tier structure (see image below)
- ○ PACS are outside the purview of the Banking Regulation Act, 1949, and therefore not regulated by RBI.

What are Common service centres (CSC)?

- Common Service Centres are physical facilities for delivering Government of India e-Services to rural and remote locations where the availability of computers and Internet was negligible or mostly absent.

UNESCO to soon declare Visva-Bharati the world's first living heritage university

- Context: Founded by Rabindranath Tagore in 1921, Visva-Bharati University will soon get the 'heritage' tag from UNESCO to take the distinction of world's first living heritage university.
- Normally heritage tag is given to a dead monument. For the first time in the world, a living university, which is functioning, is going to get the heritage tag from UNESCO.
- About Visva Bharati University:
- When founded in 1921 it was named after Nobel Laureate Rabindranath Tagore until the Visva-Bharati Society was registered as an organization in May 1922.
- In 1922, Visva-Bharati was inaugurated as a Centre for Culture with an exploration into the arts, language, humanities, &
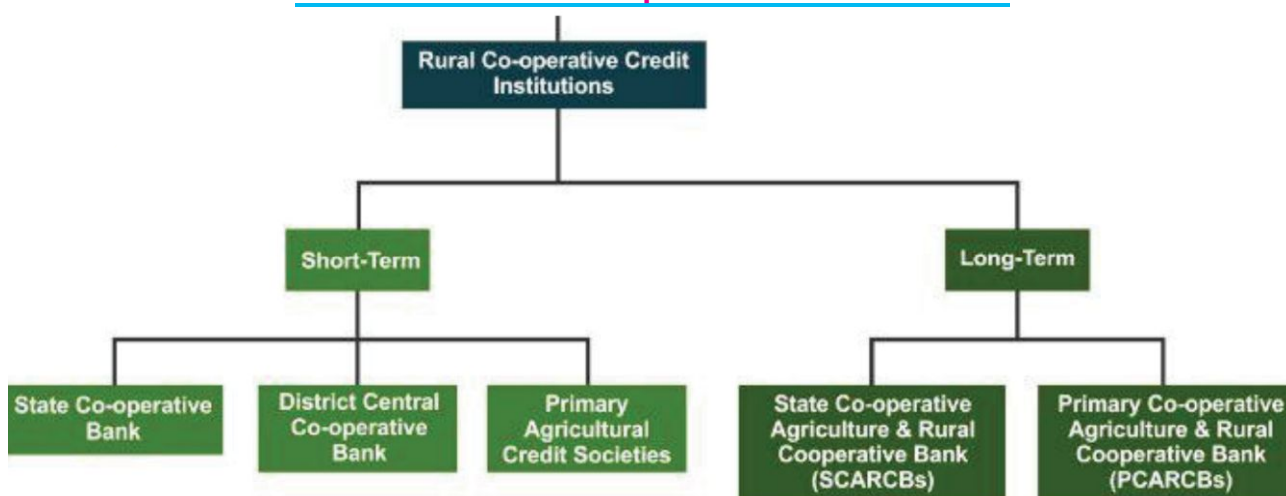
music and these are reflected in diverse institutes that continue in their educational programmes.

- The structures in these institutes constitute a myriad of architectural expressions: the Kalo Bari, a mud structure with coal tar finish and sculpture panels; Mastermoshai studio, a single-storied structure built for the first principal of Kala Bhavan, Nandalal Bose; murals and paintings on Cheena and Hindi Bhavan, created by the illustrious artists like Benodebehari Mukhopadhyay, Nandalal Bose, Surendranath Kar, Somnath Hore with the active involvement of students.

South India's 1st Industrial Corridor Project

- Context: Prime Minister, Shri Narendra Modi laid the foundation stone of South India's 1st Industrial Corridor Project to be implemented at Tumakuru under the Chennai Bengaluru Industrial Corridor (CBIC)

Structure of Rural Co-operative Credit societies

Rural Co-operative Credit Institutions

Short-Term
- State Co-operative Bank
- District Central Co-operative Bank
- Primary Agricultural Credit Societies

Long-Term
- State Co-operative Agriculture & Rural Cooperative Bank (SCARCBs)
- Primary Co-operative Agriculture & Rural Cooperative Bank (PCARCBs)

- CBIC project includes the development of industrial townships at three nodes: Krishnapatnam (Andhra Pradesh), Tumakuru (Karnataka), & Ponneri (Tamil Nadu)

About Tumakuru Industrial Township

- It has been planned with a holistic and integrated approach in line with the principles of PM-GatiShakti to address the issue of last-mile multi-modal connectivity to the economic zone

About National Industrial Corridor Development Programme:

- National Industrial Corridor Programme (NICP) (started in 2007) is an infrastructure programme of the Government of India aiming to develop industrial cities in the country
- Objective: Enhance India's competitiveness in manufacturing through the creation of world-class infrastructure and reduced logistics costs

- Implementation: 32 greenfield industrial smart cities under 11 industrial corridors are being developed with world-class Plug-n-Play infrastructure.
- Mantra: "Reform, Perform and Transform"
- Progress: Four such smart industrial cities have already been completed at Dholera in Gujarat, ShendraBidkin in Maharashtra, Vikram Udyogpuri in Madhya Pradesh, Integrated Industrial Township at Greater Noida in Uttar Pradesh
- Nodal Agency: DPIIT (Ministry of Commerce)

ASI's Keeladi report pushes Sangam age further back to 800 BCE

- Context: The Sangam age has been pushed to 800 BCE based on the archaeological findings from an excavation carried out by the Archaeological Survey of India.

- Based on the results of stratigraphy of the cultural deposits, the period of the Sangam era archaeological site has been placed between the 8th century BCE to the 3rd century CE(800 BCE and 300 CE)
- Sangam age was believed to be between 300 BCE to 300 CE.
- It has been classified into three periods:
  ○ The pre-early historic period between 800 BCE to 500 BCE
  ○ The mature early history between 500 BCE to the end of 1st century BCE
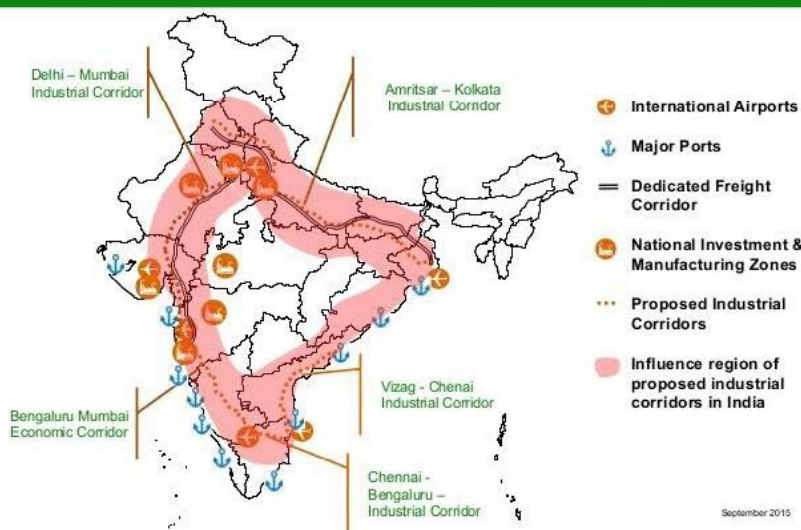 ○ Post-early history from 1st century BCE to 300 CE

QR code-based Coin Vending Machine (QCVM)

- Context: To improve the distribution of coins, the RBI is preparing a pilot project on QCVM in collaboration with a few leading banks

What is the QCVM?

- It is a cashless coin dispenser that dispenses coins in exchange for a bank account debit via the Unified Payments Interface (UPI).
- Unlike traditional cash-based Coin Vending Machines, the QCVM would not require banknote tendering or validation.
- This will offer ease and ready access to coins for customers via the UPI facility.

Presence of Industrial & Transport infrastructure

Delhi – Mumbai Industrial Corridor
Amritsar – Kolkata Industrial Corridor
Bengaluru Mumbai Economic Corridor
Vizag - Chenai Industrial Corridor
Chennai - Bengaluru – Industrial Corridor

International Airports
Major Ports
Dedicated Freight Corridor
National Investment & Manufacturing Zones
Proposed Industrial Corridors
Influence region of proposed industrial corridors in India

September 2015

First District to register 10,000 new MSMEs

- Ernakulam has become the first district in the state to register more than ten thousand new MSMEs.
- The other districts such as Thrissur and Malappuram are also moving close to the number.
- The Kerala Government launched the Enterprises Campaign during its 2022-23 budget.
- Also, the state government

declared the financial year 2022-23 as the Year of Enterprises.
- This was done to boost the development of the MSME sector in the state

Microsoft's Project ELLORA

- To bring 'rare' Indian languages online, Microsoft launched project ELLORA or Enabling Low Resource Languages in 2015.
- Under the project, researchers are building digital resources of the languages.
- Microsoft's Project ELLORA is helping small languages like Gondi, Mundari become eloquent for the digital world.
- The researchers are mapping out resources, including printed literature, to create a dataset to train their AI model.
  - There are around 1.2 billion people, which is 20% of the world's population, can't use their language to navigate the digital world.

Black Buck

- Context: The blackbuck population has increased threefold in Odisha's Ganjam district, with no cases of poaching for several years.
- Their number increased from around 2000 (2011) to over 7000 (2022)

Measures behind the success of Conservation:

- Improvement of habitats: Salt licks and water holes have been created, and a watch tower and a rescue-cum-treatment centre have been established
- Protection by the local people and forest staff: Like the Bishnoi tribe (western Rajasthan) and the ValaRajputs (Saurashtra), the people of Ganjam district in Odisha protect the blackbuck, as its sightings are considered an indicator of good luck.
  - It's a common belief that the more the animals eat, the higher the agricultural yield
- Speed breakers and road humps

have been installed in vulnerable areas to prevent accidents

About Blackbuck:

- Blackbuck (Antilope cervicapra) is native to India and Nepal.
- Region: Rajasthan, Gujarat, Madhya Pradesh, Tamil Nadu, Odisha

Features:

- Grassland species
- The fastest animal in the world, next to Cheetah.
- Diurnal antelope (active mainly during the day).
- State Animal of Punjab, Haryana, and Andhra Pradesh.
- Cultural Importance: It is a symbol of purity and good luck in Hinduism and Buddhism.
- Wildlife (Protection) Act, 1972: Schedule 1
- IUCN: 'near threatened'
- Cites: Appendix III

IFFCO Nano Urea Liquid Plants

- Context: Union Ministry of Chemicals and Fertilizers has launched the IFFCO Nano Urea Liquid Plants at Aonla and Phulpur in Uttar Pradesh

What is liquid nano urea?

- Urea is a chemical nitrogen fertilizer, white in colour, which artificially provides nitrogen, a major nutrient required by plants.
- Liquid nano urea is essentially urea in the form of a nanoparticle.

Benefits:

- Cost: liquid nano urea is cheaper than Urea

- The efficiency of liquid nano urea can be as high as 85-90 per cent (Conventional urea has an efficiency of about 25 per cent).
- Liquid nano urea has a shelf life of a year, and farmers need not be worried about "caking" when it comes in contact with moisture
- Nano form provides a targeted supply of nutrients to crops
- Reduces fertilizer subsidy bill of the government.

About Indian Farmers Fertiliser Cooperative Limited (IIFCO)

- IIFCO (est. 1967) is one of India's biggest cooperative societies which is wholly owned by Indian Cooperatives. Its objective is to provide a timely supply of reliable, high-quality agricultural inputs and services in an environmentally sustainable manner.

Driving Holistic Action for Urban Rivers (DHARA)

- Context: DHARA the annual meeting of the members of the River Cities Alliance (RCA), is being organised by the National Mission for Clean Ganga (NMCG) in association with the National Institute of Urban Affairs (NIUA)

About DHARA:

- It provides a platform to co-learn and discuss solutions for managing local water resources.

About River Cities Alliance:

- RCA is a dedicated platform for river cities to ideate, discuss and exchange information for sustainable management of urban rivers.
- It includes cities from both the Ganga basin and non-Ganga basin states.
- It is being implemented by a partnership of the Ministry of Jal Shakti and the Ministry of Housing and Urban Affairs
- River Cities Alliance (RCA) started with 30 cities in 2021 and currently has 95 cities as members across India
- It has strong synergies with the Urban20 (U20) initiative (under India's G20 Presidency) to promulgate urban water security.

OmorgusKhandesh'

- Context: A new beetle species 'OmorgusKhandesh' has been discovered in India recently.
- The beetle is important for forensic science as it helps detect the time of death of an animal or human.

About OmorgusKhandesh:

- OmorgusKhandesh is necrophagous and is, therefore, also called a keratin beetle.
- The new species belongs to the Trogidae family. With the addition of this new species, now there are a total of 14 extant species of this family in India.
- During the decomposition of a body, blowflies are amongst the first ones to arrive in the early stages. Meanwhile, the final successional stage is with

the arrival of the keratin feeders, thus their importance in forensic science.

Efforts against Child Marriage

- Odisha in India has been successful in reducing child marriage rates through a long-term strategy that involves:
- Tracking the absence of girls in schools and villages
- Counselling by representatives of district administration
- Linking all schemes targeting girls on a platform called 'Advika – Every Girl is Unique.'
- Monetary incentives to vulnerable tribal groups
- Child-friendly policing and sensitization week
- Community efforts for behavioural changes: Representatives of the panchayat, parents, and children conduct monthly meetings in the community to discuss dropping out from school and child marriages

KhananPrahari Application

- The government has launched a mobile app namely 'KhananPrahari' and a CMSMS web portal.
- CMSMS strands for Coal Mine Surveillance and Management System.
- It allows reporting unauthorized coal mining activities.
- The illegal mining of minor minerals is common in states like AP, Telangana, and TN

- Illegal mining of major minerals like coal is common in north eastern states like Assam and Meghalaya.
- India ranks topmost in illegal sand mining.

KHAN PRAHARI

- A Tool For Reporting Illegal Coal Mining Incidents
- Transparency: Public will be provided an access to the system
- Bias-free and Independent: The system is based on satellite data
- Deterrence Effect: Surveillance system using space technology
- Quicker Response: The coal mining areas will be monitored regularly
- Effective Follow-up: Actions taken on triggers will be followed up at various levels

Astronaut training module

- IIT Madras plans to develop a training module for the Indian Spaceflight Program.
- This training module will be created on the basis of Augmented Reality (AR)/ Virtual Reality (VR) / Mixed Reality (MR).
- ISRO and IIT Madras inked a Memorandum of Understanding (MoU) to work together on this Program.

JaduiPitara

- 'JaduiPitara' -a play-based learning-teaching material tailored for children between the age group of 3-8 years

- Developed under the National Curriculum Framework for Foundational Stage (part of the implementation of the New Education Policy 2020)
- Available in 13 Indian languages
- Includes playbooks, toys, puzzles, posters, flashcards, storybooks, and worksheets that reflect local culture and social contexts.

Aim:

- Accommodate the diverse needs of learners and pique curiosity
- Making the learning-teaching environment more child-centric, lively, and joyful
- Usage: This example can be used in Governance, Social justice, and Ethics (case study) as a unique example of a child-centric foundational literacy initiative

Anubhuti Inclusive Park

- Union Minister for Road Transport and Highways laid the Foundation Stone of the world's largest and unique Divyang Park – Anubhuti Inclusive Park in Nagpur, Maharashtra.
- Features of the park: Facilities for all 21 types of disabilities, such as a touch and smell garden, hydrotherapy unit, water therapy, and independent room for mentally challenged children, and mothers.
- Vision: To build an inclusive society, with the aim of showing empathy instead of sympathy

towards persons with disabilities. to give the disabled the right to live with dignity.

- Usage: This can be used as an example in social justice, Indian society and Ethics paper.

- The park aims to set an example of empathy, respect and dignity towards people with disabilities, while also catering to the needs of the general public and different age groups.

Zaid Campaign-2023

- Context: Union Agriculture and Farmers Welfare Minister chaired the National Conference on Agriculture for Zaid (Summer) Campaign-2023 in New Delhi

Rabi	Kharif	Zaid
i) Winter cropping season is known as Rabi.	i) Wet summer cropping season is known as Kharif.	i) Dry summer cropping season is known as Zaid.
ii) Rabi crops are sown in winter from October to December.	ii) Kharif crops are grown with the onset of monsoon in June.	ii) Zaid is a short intervening cropping season in between rabi and kharif season
iii) The crops are harvested in summer from April to June.	iii) The crops are harvested in September-October.	iii) The crops are grown in summer months (March to May).
iv) Availability of precipitation during winter months due to western disturbances helps in the success of these crops.	iv) These crops have high water requirement either from monsoon rain or by irrigation.	iv) They are irrigated crops.
v) Wheat, barley, peas, gram and mustard are examples of crops growing in Rabi season.	v) Paddy, maize, jowar, bajra, tur (arhar) moong, urad, cotton, jute, groundnut and soyabean are examples.	v) Watermelon, muskmelon, cucumber, vegetables and fodder crops are examples of crops growing in Zaid season.

Various initiatives for agriculture:

- 22 crore Soil Health Cards have been distributed (to preserve the fertility of our earth)
- Alternatives to chemical fertilizers, —nano urea, and biofertilizer.
- Cultivation area under organic and natural farming is increasing
- Pradhan Mantri Kisan Samman Nidhi
- Krishi Vigyan Kendra and ATMA
- The number of Kisan SamridhiKendras has now increased to 12,000
- PM-PRANAM scheme (to reduce the usage of chemical urea)

- Seed Traceability system (to ensure availability of quality seeds)
- A pesticide Management System will also be implemented.

Rating of Buildings or Areas for Digital Connectivity

- Context: The Telecom Regulatory Authority of India (TRAI) recently released its recommendations on "Rating of Buildings or Areas for Digital Connectivity"
- Objective: This is to promote making Digital Connectivity Infrastructure (DCI) an intrinsic part of building development plans similar to other building services such as water, electricity etc.

- Recommendations: Amendment in the Model Building Bye-Laws (MBBL) and National Building Code of India (NBC); Buyer-builder agreements should specify requirements for DCI; System for rating buildings for DCI (on lines of green buildings rating)

About TRAI:

- The Telecom Regulatory Authority of India is a regulatory body (for the telecommunications sector in India) set up by the Government of India under the Telecom Regulatory Authority of India Act, 1997.

Product Linked Incentive (PLI) scheme of pharmaceuticals

- Context: Department of Pharmaceuticals (DoP) has released the first tranche of incentives under the Product Linked Incentive (PLI) scheme of pharmaceuticals

- Under the Atmanirbharta initiative of the Government, the Department of Pharmaceuticals launched the PLI scheme for pharmaceuticals in 2021

- Objective: To enhance India's manufacturing capabilities and contribute to product diversification towards high-value goods in the pharmaceutical sector

Three different categories of products are being supported under the scheme:

- Category 1: Biopharmaceuticals; Complex generic drugs; Patented drugs or drugs nearing patent expiry; Cell-based or gene therapy drugs; Orphan drugs; Special empty capsules, Complex excipients,

- Category 2: Bulk drugs

- Category 3: Drugs not covered under Category 1 and Category 2 such as Repurposed drugs; Autoimmune drugs, anti-cancer drugs, etc.

Quality Control Orders

- Context: Ministry for Commerce and Industry, Consumer Affairs, Food and Public Distribution and Textiles has said that there is a need to issue Quality Control Orders (QCOs) across sectors in the electrical industry.

- It will help save the industry from unfair competition from non-transparent economies which are pumping low-quality goods and sub-optimal goods into the country

- Also, Government has extended QCOs for ferronickel grade for six months.

About Ferronickel

- It is a ferroalloy containing Iron and Nickel, used to produce stainless steel and nickel alloy steels.

About QCO

- They are issued by various Ministries/Departments to regulate the quality of products and ensure compliance in the exercise of powers conferred under the Bureau of Indian Standards (BIS) Act, 2016.

- Items, under these orders, cannot be produced, sold/traded, imported and stocked unless they bear the BIS mark.

Rooftop solar for poverty alleviation

- Context: A new white paper proposes a scheme for rooftop solar photovoltaics (RTPV) for poverty alleviation.

Significance of RTPV for poverty alleviation in India:

- Access to Electricity: Solar energy can provide access to electricity in remote areas that are not connected to the power grid, thus improving the quality of life for people living in poverty.
  - In China, RTPV is one of the identified 10 initiatives rolled out by the government to lift rural households out of poverty.

- Cost Savings: For people living in poverty, who spend a significant portion of their income on energy, solar energy can help reduce their energy bills and save money.

- Job Creation: at the lower and middle level

- Improved Health: Solar energy can help reduce indoor air pollution and improve the health of people living in poverty.

- Climate Change Mitigation

Limitations:

- High initial cost: Currently, the rooftop-subsidy programmes run by the Ministry of New and Renewable Energy require consumers to bear about 60 per cent of the costs.

- Roof Availability: For many poor, having roof space is a luxury.

- Dependence on Weather: In areas with low sunlight, or during monsoon season, solar energy production may be limited, which can be a challenge for those relying on it for electricity.

- Maintenance: Solar panels require regular maintenance, which can be a challenge for people living in poverty who

may not have the resources or knowledge to maintain them.

- Implementation issues: India had achievedjust 7.9 GW of installed rooftop solar capacity as of June 2022 (against a previous target of 40 GW by 2022).

Government measures:

National level:

- The government has extended the timeline for achieving its target of 40000 MW (40 GW) rooftop solar (RTS) capacity addition, by March 2026.
  - Gujarat, Maharashtra and Haryana statesare leading the way
- Grid-Connected Rooftop Solar Scheme
- Kisan Urja Suraksha evamUtthaanMahabhiyan (PM-KU-SUM): for grid-connected Renewable Energy power plants/ Solar water pumps/grid-connected agriculture pumps)
- National Wind-Solar Hybrid Policy 2018::To provide a framework for the promotion of large grid-connected wind-solar PV hybrid systems
- Atal Jyoti Yojana (AJAY, 2016): for the installation of solar street lighting (SSL) systems in states with less than 50% of households covered with grid power
- National Solar Mission(a part of the National Action Plan on Climate Change)
- Surya Mitra Skill Development Programme:To provide skill

training to rural youth in handling solar installations.

International Level:

- International Solar Alliance:
- One Sun, One World, One Grid (OSOWOG): a framework for facilitating global cooperation, for interconnected renewable energy resources

What is the proposed scheme for RPTVs?

- The report proposes a Central government-sponsored scheme in the field of RTPV. It could be called Sooraj Se Rozgaari.
- Under the proposed scheme, IREDA will purchase RTPV modules in bulk and transfer them to states at a cheaper cost. Low-income households do not have to pay for any share of the costs of RTPV installation and maintenance.

- Social/institutional/small businesses bear 80 per cent of the costs, and households with regular incomes bear 60 per cent.

Use of Phosphor-Gypsum in National Highway Construction

- Context: National Highways Authority of India (NHAI) and the Department of Fertilizers, Ministry of Chemicals and Fertilizers are going to take up field trials on NHAI projects for use of Phosphor-Gypsum (Phosphogypsum) in National Highway construction to achieve a circular economy in the use of Gypsum.

About Phosphogypsum:

- Phosphogypsum (PG) is the calcium sulfate hydrate formed as a by-product of the production of fertilizer from phosphate rock.

Gypsum vs Phosphogypsum Phosphogypsum

	Gypsum	Phosphogypsum
Definition	Gypsum is a mineral containing calcium sulfate, and it has the molecular formula CaSO4-2H2O.	Phosphogypsum refers to the hydrated calcium sulfate that forms as a byproduct of fertilizer production from phosphate rock
Occurrence	Natural	Synthetic
Production	Via mining or quarrying	As a byproduct of phosphate fertilizer production

Extension of 22nd Law Commission

- Context: The government has approved the extension of the term of the twenty-second Law

Commission of India up to August 31, 2024.

- The 22nd law panel was constituted for three years on February 21, 2020

Neutral citation system

- Context: The Chief Justice of India (CJI) announced that the SC will adopt a "neutral citation system" for its judgments.

What is a "citation"?

- A case citation is essentially an identification tag for a judgment and it would contain a reference number, the year of the judgment, the name of the court, etc.

- For example, for the landmark Kesavananda Bharati case, the citation is AIR 1973 SC 1461.

What is a neutral citation?

- A neutral citation would mean that the court would assign its own citation (distinct from those given by traditional Law Reporters), enabling a uniform citation.

- Law Reporters are periodicals or annual digests that publish judgments, often with an editorial note to make it accessible for lawyers to refer to precedents.

- The Delhi, Kerala, and Madras HCs have already introduced neutral citations.

Ayushman Bharat Digital Mission

- Context: The National Health Authority (NHA) under its flagship Ayushman Bharat Digital Mission (ABDM) introduced the Scan and Share (QR-code-based) service for faster OPD registrations in 2022.

Ayushman Bharat- PM Jan Aarogya Yojana and Digital Mission

Context: Govt to combine CGHS with Ayushman Bharat; and Ayushman Bharat School Health and Wellness Programme (SHWP) has less than 50% uptake

About ABPM-JAY

- It is the **world's largest health assurance scheme** (launched in 2018 by **MoH&FW**). It provides medical insurance of Rs **5 Lakh to over 10 Cr marginalized families** (identified through SECC 2011 data) for secondary and tertiary care hospitalization.
- Centrally **sponsored** scheme
- Funding: **60:40 & 90:10** (NE states and three Himalayan states- J&K, Himachal and Uttarakhand)
- **No limit** on family size covered or age of members.
- It covers **pre-existing diseases**
- Implementation by **National Health Authority**

Ayushman Bharat Digital Mission (ABDM)

- It aims to develop the **digital backbone** for integrated digital health infrastructure.
- launched in **2021**, it is **Central sector scheme**
- It contains: ABHA health account numbers; ABHA App; Health Facility Registry and Unified Health Interface (for patients and health provider interactions)
- Implementation: **National Health Authority** under MoH&FW.

How has this initiative performed?

- Within five months of its launch, the service has been adopted by 365 hospitals and has helped over 5 lakh patients save time by drastically reducing wait times.

1st indigenously developed ATS system

- Context: India launched the first ever indigenously developed Train Control and Supervision System.

- India becomes the sixth country which has its own ATS products

What is i-ATS (Indigenous-Automatic Train Supervision) system?

- It is a computer-based system that will manage train operations such as running and halting.

- It is part of the CBTC (Communication-Based Train Control) Signalling system.

- The system has been launched by Delhi Metro Rail Corporation (DMRC) on its first corridor

Revised guidelines for MPLADS

- Context: Ministry of Statistics and Programme Implementation (MoSPI) released the Revised Guidelines on Members of Parliament Local Area Development Scheme (MPLADS)-2023

Revised Guidelines:

- The new guidelines broaden

---

the scope of the Scheme so as to enable the parliamentarian to recommend works as per the changing needs of the community

- New Web Portal: Entire process of fund flow under the revised guidelines will operate through the web portal

- This will facilitate real-time monitoring, greater transparency and accountability in the system, and improved efficiency and effectiveness of the MPLAD Scheme.

Robotic Manhole cleaners

- The Kerala government launched robotic scavenger, Bandicoot to clean sewages in this temple town.

- Thus, it was becoming the first state in the country to use robotic technology to clean all its commissioned manholes.

- Bandicoot is the world's first robotic scavenger.

- Bandicoot, developed by Kerala-based Genrobotics, had recently bagged 'Kerala Pride' award at the Huddle Global 2022.

- Bandicoot robots are currently deployed in few towns across 17 states in India and three Union Territories.

MPLAD Scheme
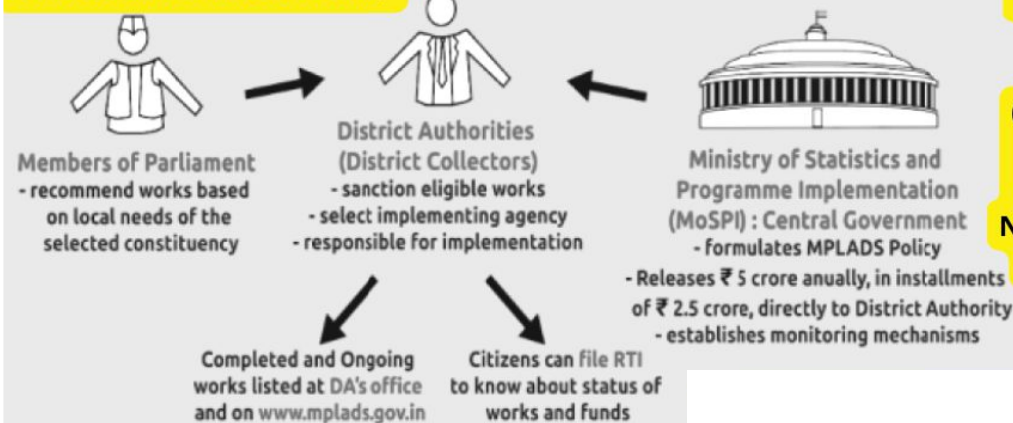
MoSPI released the Revised Guidelines on MPLADS-2023

MoSPI: responsible for Policy, release of funds and monitoring

About the Scheme

- **Objective:** MPs to recommend works of developmental nature for the creation of durable community assets based on the local needs.
- **Central Sector Scheme** (100% union funding); Launched in 1993

- **Spending:** Every year, M.P. shall recommend atleast **15% of MPLADS funds** for areas inhabited by S.C. population and **7.5 percent** for areas inhabited by S.T. population
- **Nature of fund: non-lapsable**
- **Interest accrued on unused fund:** Will be compulsorily remitted to the **Consolidated Fund of India** (Article 266 (1))(It cannot be used by MPs)

Recommendation of Work: Lok Sabha MPs (only in their constituencies); Rajya Sabha (anywhere in their state, from which he/she is chosen); Nominated Member (Anywhere in the country)

How does MPLADS Work?

Members of Parliament - recommend works based on local needs of the selected constituency

District Authorities (District Collectors) - sanction eligible works - select implementing agency - responsible for implementation

Ministry of Statistics and Programme Implementation (MoSPI) : Central Government - formulates MPLADS Policy - Releases ₹ 5 crore anually, in installments of ₹ 2.5 crore, directly to District Authority - establishes monitoring mechanisms

Completed and Ongoing works listed at DA's office and on www.mplads.gov.in

Citizens can file RTI to know about status of works and funds

Sovereign Green Bonds (SGrBs)

- RBI issued maiden sovereign Green Bonds worth Rs. 8,000 crore.
- If was announced in Union Budget 2022 – 23 and framework for SGrBs was issued by Ministry of Finance in November 2022.
- Green bonds are financial instruments that generate proceeds for investment in environmentally sustainable and climate – suitable projects.
- Proceeds from these bonds will be deployed in public sector projects of renewable energy.
- Clean transportation, climate change adaptation, sustainable water & waste management etc.

Biotin – (Vitamin B7)

- Dermatologists have cautioned that indiscriminate use of biotin can be detrimental to one's health.
- It is a water – soluable B Vitamin found naturally in some foods and also in supplements.
- It plays a vital role in assisting enzymes to break down facts, Carbohydrates, & proteins in food.
- It also helps to regulate signals sent by cells & activity of genes.

Native Indian cow breeds

- For the first time, Indian Institutee of Science education and Research have unravelled genetic makeup of native Indian cow breeds
  - ○ i.e., Kasargad Dwarf, Kasargad Kapila, Vechur & Ongole.
- Native Indian cows have special abilities such as tolerant to heat, resistant to certain diseases.
- Till now, there is no genome of Indian cows available & country dependent other countries.
- Genome is like a blueprint or a set of instructions required by an organism to survice. It's made up of tiny units called genes.

Open Air Museum in Sivakalai

Excavation works

- Excavation works have been carried out by the Tamil Nadu government at Adichanallur near Srivaikundam, Shivalagi near Eral, Korkai and other places in Thoothukudi district which are the cradle of civilization of ancient Tamils.
- Excavations in three phases at

ShivakalaiParumbu area have yielded many items such as jar burials, earthenware, iron items, copper coin, spinning wheel, stone for grinding metals, ceramic bangles, gold ornaments etc.

Open Air Museum

- In the SivakalaiParumbu area, iron sheet roofs have been erected at a total cost of Rs 23 lakh at 2 excavated sites in the first phase for the purpose of setting up an open air museum.
- An open-air museum will be set up so that the public can easily see the antiques including old people's talismans in the excavation pits.

Keezhadi excavation site

- Thousands of antiquities have been found in different stages of excavation near Tiruppuvanam in Sivaganga district.
- The excavation site is constructed with separate buildings for metal objects, pottery objects, ancient building models, earrings and gold objects.
- Artifacts found in underground excavations are known to be 2600 years old
- It has been revealed that the Tamils were living with civilization 4000 years ago through the artifacts found in the underground excavations.
- A new Excavation Building has been set up at a cost of Rs 11.03 crore with Chettinad artistry so that people from different parts of the world can easily see and learn about the artifacts found in the excavations.

முதன்மைத் தேர்வுக்கான உத்தி

1. முதன்மைத் தேர்வுக்குப் படிப்பதற்கு முறையானத் திட்டத்தை வகுத்து அதை முழுமையாகப் பின்பற்ற வேண்டும்.

2. நாட்டு நடப்புகள் குறித்த விவரங்களை தினமும் தயார் செய்ய வேண்டும். புதிய தகவல்களைத் தொடர்ந்து தெரிந்து கொள்ள வேண்டும்.

3. தேர்வுக்குத் தயாராவதில் உறுதியாக இருக்க வேண்டும்.

4. ஒவ்வொரு பாடத்திற்கும் ஒதுக்கப்பட்டுள்ள மதிப்பெண்களைக் கருத்தில் கொண்டு அனைத்துப் பாடங்களுக்கும் தயாராவதற்கு போதிய நேரத்தை ஒதுக்க வேண்டும்.

5. தேர்வுக்குத் தயாராவது அலுப்பூட்டும் வகையில் இல்லாமல் இருப்பதை உறுதி செய்யும் வகையில் கால அட்டவணை தயாரிக்கப்பட வேண்டும்.

6. திருப்புதலின் போது நேரத்தை மிச்சப்படுத்துவதற்காக, முதல் முறை அல்லது இரண்டாவது முறை பயிலும் போது முக்கிய அம்சங்களை அடிக்கோடிட்டு வைத்திருக்க வேண்டும் / முன்னிலைப்படுத்த வேண்டும். நாம் முதன்முறை படிப்பதன் நோக்கம் தேவையற்ற விசயங்களை விலக்கி, நாம் படிக்க வேண்டிய பாடங்களின் அளவைப் பாதியாகக் குறைப்பதுதான். இரண்டாவது முறை பயிலும் போது, நாம் படிக்க வேண்டிய பகுதிகளை, தேர்வுக்கு முன் உள்ள இரண்டு நாட்களில் திருப்புதல் செய்யும் வகையில், மேலும் குறைக்க வேண்டும்.

7. முந்தைய ஆண்டு வினாத்தாள்களின் அடிப்படையில் விடைகளை எழுதிப் பயிற்சி செய்ய வேண்டும்.

8. தேர்வை எதிர்கொள்வதற்கு ஒரு விண்ணப்பதாரர் எந்த அளவுக்குத் தயாராகியிருக்கிறார் என்பதைப் புரிந்துகொள்வதற்காக அடிக்கடி மாதிரித் தேர்வுகளை எதிர்கொள்ள வேண்டும்.

9. பயிற்சியே ஒருவனை முழுமையாக்குகிறது என்பதே முதன்மைத் தேர்வுக்கான மந்திரமாக இருக்க வேண்டும்.

10. எந்தவொரு பாடத்திற்குமான பயிற்சியில் சேரும் தேர்வர்கள், அதற்கான மாதிரித் தேர்வுகளில் முழு ஈடுபாட்டுடன் பங்கேற்க வேண்டும். முதன்மைத் தேர்வுக்கும், முதல்நிலைத் தேர்வுகளுக்கும் இடையிலான முக்கியமான வேறுபாடு என்னவென்றால், முதல்நிலை தேர்வுக்கான மாதிரித் தேர்வுகளை மூன்றாவது நபரின் துணை இல்லாமல் ஆன்லைனிலோ, ஆஃப்லைனிலோ தனித்தே எழுதலாம். ஆனால் முதன்மைத் தேர்வைப் பொறுத்தவரை மூன்றாவது நபரைக் கொண்டு மதிப்பீடு செய்வது மிகவும் அவசியமாகும். மதிப்பீடு செய்யும் மூன்றாவது நபர் ஒரு வல்லுநராகவோ, அல்லது சிறந்த ஒரு பயிற்சி நிறுவனமாகவோ இருக்கலாம்.

11. முதன்மைத் தேர்வு என்பது தேர்வர் அறிந்துள்ள தகவல்களையும் அவரது நினைவுத் திறனையும் மட்டுமே சோதிப்பதாக இல்லாமல், அவர்களின் புரிதலின் ஆழம், அறிவுசார் திறன்கள் ஆகியவற்றை மதிப்பிடுவதை நோக்கமாகக் கொண்டது ஆகும். பொதுபாடத் தாள்களில் அனைத்து வினாக்களுக்கும் விடை அளிக்க வேண்டும். வினாக்களின் தன்மை ஒவ்வொரு தாளுக்கும் மாறுபடும். ஆனால், அதிக வினாக்கள் இருக்கும் என்பதால் தேர்வர் விடைகளை வேகமாக எழுத வேண்டும். விடையளிக்க வேண்டிய வார்த்தைகளின் வரம்பும் அதிகமாக இருக்கக் கூடும்.

12. முதன்மைத் தேர்வைப் பொறுத்தவரை, வார்த்தைகளின் எண்ணிக்கையை கவனத்தில் கொள்ளப்பட வேண்டிய மிக முக்கியமான அம்சமாகும்.

13. முதன்மைத் தேர்வுகளை எழுதுவதற்கான அணுகுமுறையில் தேர்வர்கள் மிகவும் தெளிவாக இருக்க வேண்டும். தேர்வு அறையில், வினாத்தாளைப் பெற்ற பிறகு, விடைகளை வேகமாக எழுத வேண்டி இருக்கும் என்பதால், சிந்திப்பதற்கு நேரம் இருக்காது. எனவே, வினாக்களை புத்திசாலித்தனமாகத் தேர்வு செய்து விடை அளிக்க வேண்டும்.

14. வினாக்களில் தரப்பட்டுள்ள கருத்துரை கொடு, கருத்து தெரிவி, விரிவாகச் சொல், காட்சிப்படுத்து, தெளிவுப்படுத்து போன்ற வார்த்தைகளின் பொருளைப் புரிந்துகொண்டு, அதற்கேற்ற வகையில் உங்கள் எழுத்துத் திறனை வெளிப்படுத்த வேண்டும்.