

1. Graphene Innovation Centre

Why in News?

- The Kerala government has recently announced that the country's first Graphene Innovation Centre would come up in Thrissur, Kerala.

Highlights:

- It is a joint venture of Digital University of Kerala, Centre for Materials for Electronics Technology (C-MET) and Tata Steel Limited.
- The researchers from the City University of Hong Kong had produced a laser-induced form of graphene masks that inactivate the coronavirus species.
- An Innovation Center is a cross-functional plan that creates a safe haven for new ideas.
- With opportunities for individual and group collaboration across time zones and continents, it's a place that fosters a culture of innovation through the creation, sharing, and testing of ideas.
- The India Innovation Centre for Graphene would come up in Thrissur at a cost of Rs 86.41 crore. Of the 86.41-crore, the Union Government would provide Rs 49.18 crore and private business houses Rs 11.48 crore.
- The state government would provide the basic infrastructure for the project. The Centre would help attract investors to develop graphene products.
- The project would give a major fillip for scientific research as well as the state's industrial Sector. Kerala's human resources capital could be effectively exploited by the proposed Centre, which would help Kerala to emerge as a knowledge-based economy.
- Graphene is a one-atom-thick layer of carbon atoms arranged in a hexagonal lattice. It is the building-block of Graphite, but graphene is a remarkable substance on its own with a multitude of astonishing properties.

2. Virtual Digital Assets

Why in News?

- The finance minister in her Budget 2022 has recently announced a 30% tax on income from virtual digital assets.

Highlights:

- She also proposed a Tax Deduction at Source (TDS) on payment made in relation to the transfer of virtual digital assets at 1% above a monetary threshold.

- A person (deductor) who is liable to make payment of specified nature to any other person (deductee) shall deduct tax at source and remit the same into the account of the Central Government.
- The finance bill defined the term “virtual digital asset” by entering a new clause (47A).
- As per the proposed new clause, a virtual digital asset is proposed to mean any information or code or number or token (not being Indian currency or any foreign currency), generated through cryptographic means.
- Virtual digital assets have gained tremendous popularity in recent times and the volumes of trading in such digital assets has increased substantially.
- A market is emerging where payment for the transfer of a virtual digital asset can be made through another such asset.
- These factors have made it imperative to provide for a specific tax regime.
- A currency is a currency only when it is issued by the central bank even if it is a crypto.
- Anything which is outside of that loosely all of us refer it to be cryptocurrency but they are not currencies. These can be referred to as Virtual Digital Assets.
- Virtual Digital Assets also include Non-fungible tokens or NFTs , which are cryptographic assets on a blockchain with unique identification codes and metadata that distinguish them from each other. NFTs can also be used to represent individuals' identities, property rights, and more.
- This differs from fungible tokens like cryptocurrencies, which are identical to each other and, therefore, can be used as a medium for commercial transactions.
- The finance minister clarified that what the RBI will issue in the next fiscal will be the digital currency. This will be called Digital Rupee.

3. Coal Gasification Projects

Why in News?

- The Delhi-based non-profit, Centre for Science and Environment (CSE), has recently raised concerns about the Union Government’s announcement on coal gasification projects in the Budget 2022-23.

Highlights:

- The budget proposed four pilot projects for coal gasification and conversion of coal into chemicals required for the industry.

- According to CSE, the process of coal gasification is not attractive from a climate change point of view.
- Coal gasification is a process in which coal is partially oxidised with air, oxygen, steam or carbon dioxide to form a fuel gas.
- This gas is then used instead of piped natural gas, methane and others for deriving energy.
- In-situ gasification of coal – or Underground Coal Gasification (UCG) – is the technique of converting coal into gas while it is still in the seam and then extracting it through wells.
- Production of Syngas: It produces Syngas which is a mixture consisting primarily of methane (CH₄), carbon monoxide (CO), hydrogen (H₂), carbon dioxide (CO₂) and water vapour (H₂O).
- Syngas can be used to produce a wide range of fertilizers, fuels, solvent and synthetic materials.
- Steel companies typically use coking coal in their manufacturing process. Most of the coking coal is imported and is expensive.
- To cut costs, plants can use syngas, which comes from coal gasification plants in the place of coking coal.
- It is primarily used for electricity generation, for the production of chemical feedstocks.
- The hydrogen obtained from coal gasification can be used for various purposes such as making Ammonia, Powering a Hydrogen Economy.

4. Chandrayaan-3 set for launch in August

Why in News?

- ISRO plans to execute the Chandrayaan-3 mission in August this year.

What is Chandrayaan-3 Mission?

- The Chandrayaan-3 Mission is a follow-up of Chandrayaan-2 of July 2019, which aimed to land a rover on the Lunar South Pole.

Chandrayaan-2: A quick recap

- Chandrayaan-2 consisted of an Orbiter, Lander and Rover, all equipped with scientific Instruments to study the moon.
- The Orbiter would watch the moon from a 100-km orbit, while the Lander and Rover modules were to be separated to make a soft landing on the moon's surface.

- ISRO had named the Lander module as Vikram, after Vikram Sarabhai, the pioneer of India's space programme, and the Rover module as Pragyaan, meaning wisdom.

Utility of the Orbiter:

- The Orbiter part of the mission has been Functioning Normally. It is carrying eight Instruments.
- Each of these instruments has produced a handsome amount of data that sheds new light on the moon and offers insights that could be used in further exploration.

Inception of Chandrayaan 3:

- The subsequent failure of the Vikram lander led to the pursuit of another mission to demonstrate the landing capabilities needed for the Lunar Polar Exploration Mission proposed in partnership with Japan for 2024.
- Its design
 - ✓ The lander for Chandrayaan-3 will have only four throttle-able engines.
 - ✓ Unlike Vikram on Chandrayaan-2 which had five 800N engines with a fifth one being centrally mounted with a fixed thrust.
 - ✓ Additionally, the Chandrayaan-3 lander will be equipped with a Laser Doppler Velocimeter (LDV).

Chandrayaan-1 Mission:

- The Chandrayaan-1 mission was launched in October 2008 was ISRO's first exploratory mission to the moon, in fact to any heavenly body in space.
- The mission was designed to just orbit around the moon and make observations with the help of the instruments onboard.
- The closest that Chandrayaan-1 spacecraft came to the moon was in an orbit 100 km from its surface.

5. Definition of Forest in India

Why in News?

- The Union Ministry of Environment, Forest & Climate Change has informed about the criteria used to define forest in India.

Defining Forests universally:

- As per the Conference of Parties (CoP) 9-Kyoto Protocol, the forest can be defined by any country depending upon the capacities and capabilities of the country.

- Forest- Forest is defined structurally on the basis of
 - ✓ Crown cover percentage: Tree crown cover- 10 to 30% (India 10%)
 - ✓ Minimum area of stand: area between 0.05 and 1 hectare (India 1.0 hectare) and
 - ✓ Minimum height of trees: Potential to reach a minimum height at maturity in situ of 2 to 5 m (India 2m)

India's Definition of Forests:

- The definition of forest cover has clearly been defined in all the India State of Forest Report (ISFR) and in all the International communications of India.
- The forest cover is defined as 'all land, more than one hectare in area, with a tree canopy density of more than 10 percent irrespective of ownership and legal status.
- Such land may not necessarily be a recorded forest area. It also includes orchards, bamboo and palm'.

Classification of Forest Cover:

- In ISFR 2021 recently published has divided the forest cover as:
 - Inside Recorded Forest Area: These are basically natural forests and plantations of Forest Department.
 - ✓ Outside Recorded Forest Area: These cover mango orchards, coconut plantations, block plantations of agroforestry.

Forest Classification in India:

- The Forest Survey of India (FSI) classifies forest cover in 4 classes.
 - ✓ **Very Dense forest:** All lands with tree cover (including mangrove cover) of canopy density of 70% and above.
 - ✓ **Moderately Dense Forest:** All lands with tree cover (including mangrove cover) of canopy density between 40% and 70%.
 - ✓ **Open Forests:** All lands with tree cover (including mangrove cover) of canopy density between 10% and 40%.
 - ✓ **Scrubs:** All forest lands with poor tree growth mainly of small or stunted trees having canopy density less than 10%.