14 July 2019: Comprehensive News Analysis

TABLE OF CONTENTS

A. GS 1 Related

Nothing here for today!!!

B. GS 2 Related

Category: INTERNATIONAL RELATIONS

1. Xi-Modi meet in Varanasi on October 12

What's in the news?

- Chinese President Xi Jinping and Prime Minister Narendra Modi are set to hold their second informal summit in Varanasi on October 12th, 2019 as part of a fresh drive to energise ties following their meeting in Bishkek, Kyrgyzstan, on the sidelines of the Shanghai Cooperation Organisation (SCO) summit.

- A Chinese official said the decision to hold the second informal summit, following the Wuhan meeting in 2018, is in line with Beijing's decision to celebrate the 70th anniversary of China's diplomatic relations with India.
- Besides, it is based on the "consensus" between Mr. Xi and Mr. Modi to raise bilateral ties to a higher level, especially after the Doklam military stand-off in the summer of 2017.
- At the bilateral meeting in Bishkek on the sidelines of the Shanghai Cooperation Organisation (SCO) summit, President Xi stressed that the two countries must celebrate the 70th anniversary of their diplomatic ties befittingly after congratulating Mr. Modi once again on his victory in India's general election. It is important to note that **India and China are ancient civilisational states, which will be the pillars of the multi-polar world. This shapes the context of the meeting between the two leaders.**
- External Affairs Minister S. Jaishankar is expected to visit Beijing in August, 2019 for the second meeting of the India-China high-level people-to-people exchanges mechanism with State Councillor and Foreign Minister Wang Yi.
- While the focus of this mechanism is on people-to-people exchanges and culture, all topics of ties, including the detailing of the Varanasi summit, will be covered, except for trade and commerce.
- Railways and Commerce Minister Piyush Goyal will also visit Beijing in August 2019 to address the nearly $60-billion trade deficit between the two countries.
- As a matter of fact, India's participation in the Regional Comprehensive Economic Partnership is also expected to be discussed then.

A Look at Trade worries:

- Trade deficit is now one of the top items on the agenda.
- Modi is understood to have highlighted the need for reducing the trade gap at his meeting with Mr. Xi in Bishkek. Faced with an escalating trade war with the U.S., Mr. Xi affirmed that the issue would be addressed.
- Nevertheless, India's Ambassador to China Vikram Misri said that the **trade imbalance is not economically sustainable in the long run**. He went on to add that **it is in our mutual interest to find workable solutions before the markets react in unpredictable ways and the issue becomes politically sensitive**.
- Lastly, the boundary issue continues to impart background friction to the ties.

2. India builds 250 homes in Myanmar to assist Rohingya

What's in the news?

- Two years after more than 700,000 Rohingya fled to camps in Bangladesh alleging ethnic cleansing by Myanmar forces, the Indian government says it is stepping up efforts to help them return to their villages.
- **Recently, India's Ambassador to Myanmar, Saurabh Kumar** handed over 250 completed pre-fabricated homes to the Myanmar government for use by the refugees when they return.

Part of 2017 pact:

- The project is part of an agreement signed by the two governments in 2017, under which the government had committed to spending $25 million over five years.
- The houses, measuring 40 square metres each, are designed to survive quakes and cyclonic storms.

- The 250 houses, built in three clusters, are in the Shwe Zar, Kyein Chaung Taung and Nan Thar Taung areas that saw some of the worst cases of violence, including mass murder, gang-rape of women and children and burning of thousands of homes.
- They have cost about ₹10 crore.
- However, there are no signs yet that the Rohingya will return at any specific date.

A Look at other developments:

- The Myanmar government has also handed over a list of 21 other projects that it wants India to fund as part of the agreement, including the construction of small villages, culverts and school buildings.
- It is important to note that hundreds of thousands of Rohingya, mostly Muslim, fled the violence that started after a local militant group ARSA attacked several Myanmar police posts in August 2017, killing about 12, and also Hindus in nearby Rakhine villages.
- In attacks on the Muslim Rohingya, termed 'retaliatory' by Myanmar's Junta and the majority Buddhist community, thousands were killed**. Nearly a million Rohingya, including about 400 Hindu families, are now living in precarious conditions.**

International concern:

- The government in NayPyiTaw still refuses to recognise the Rohingya as citizens and will not prosecute military personnel and civilians for the killings, which the United Nations officials said **bore the hallmarks of genocide.**
- In such a situation, several international refugee relief and human rights agencies have counselled against forcing the refugees to return to Myanmar.
- Making the situation worse are monsoon rains and flooding at the camps in Bangladesh that have already affected about 45,000 people since April 2019, even as international funding for the camps dwindles.
- Despite the desperate situation for them, there are no signs yet that the Rohingya refugees will return at any specific date, and officials could not confirm when they would actually occupy the houses being built by India and also by Japan, China and ASEAN countries for them.

3. Sri Lanka keen on enhancing connectivity with Indian ports

What's in the news?

The Sri Lanka Ports Authority (SLPA) is keen on enhancing connectivity with Indian ports using ferry services to facilitate easier trade and tourism.

- Experts point out that if the two countries can set up a ferry service connecting Kankesanthurai port (KKS) in Jaffna with Karaikal near Puducherry, and similarly between Colombo and Tuticorin in south India, there is scope for increased trade activity and tourism.
- The ferry connection would primarily facilitate tourism and small-scale trade both ways.
- It will help especially with Buddhist tourism from the south of the island, and by extension people-to-people connections.
- Further, the KKS Port will facilitate increased trade opportunities for communities living in proximity to the port and reduce the cost of road and rail transport for bulk items such as cement.
- In 2011, India and Sri Lanka launched a ferry service between Tuticorin and Colombo, but it was soon terminated after private operators running it said it was not commercially viable.

- As a matter of fact, **the proposals fit into the SLPA's broader vision of developing Sri Lanka into a global logistics hub**, given its strategic location in the Indian Ocean, in close proximity to key, international sea routes.
- Sri Lanka is currently upgrading the KKS harbour with Indian assistance of $45.27 million, through an agreement signed with the Export-Import Bank of India.

India's role:

- India is also a partner in an initiative aimed at developing the East Container Terminal (ECT) at the Colombo Port.
- In May 2019, Sri Lanka, Japan and India signed a Memorandum of Cooperation (MoC) to jointly develop the East Container Terminal (ECT) at the Colombo Port, at an estimated cost of up to $700 million.
- The ECT has remained a contentious topic in Sri Lanka, with President Maithripala Sirisena's voicing opposition to India holding majority stake or control in it.
- However, with Japan stepping in, with a more visible and active role, the initiative has acquired some momentum in recent months.
- As per the agreement signed, Sri Lanka will have 51% stake in the terminal operating company, while the stakes to be held by Japan and India are being discussed.

C. GS 3 Related

Category: SCIENCE AND TECHNOLOGY

1. Chandrayaan-2 all set for 3.84 lakh km voyage

Background:

- Chandrayaan-2, India's second lunar mission, has three modules namely Orbiter, Lander (Vikram) & Rover (Pragyan).
- The Orbiter and Lander modules will be interfaced mechanically and stacked together as an integrated module and accommodated inside the GSLV MK-III launch vehicle.
- The Rover is housed inside the Lander.
- After launch into earth bound orbit by GSLV MK-III, the integrated module will reach Moon orbit using Orbiter propulsion module.
- Subsequently, Lander will separate from the Orbiter and soft land at the predetermined site close to lunar South Pole.
- Further, the Rover will roll out for carrying out scientific experiments on the lunar surface. Instruments are also mounted on Lander and Orbiter for carrying out scientific experiments.

What's in the news?

- **Chandrayaan-2**, which is **the first Indian moon landing mission**, is all set to head on its 3.84 lakh km voyage to the moon in the early hours of Monday, July 15, 2019.
- The Indian Space Research Organisation (ISRO) has scheduled the launch of its lunar probe, by a **GSLV MkIII rocket**, from the country's Sriharikota spaceport for 2.51 a.m.

- A sequel to Chandrayaan-1, which was launched in 2008 and only orbited the moon at a distance of 100 km, **Chandrayaan-2 entails the first attempt by any nation to make a landing on the moon's mineral rich south pole.**

Entering into an Elite group of Nations:

- The mission is to put a lander and a robotic, solar-powered rover with six wheels on the lunar terrain on September 6th, 2019 for a brief on-site exploration.
- If ISRO achieves the feat in its first attempt, it will make India only the fourth country to soft-land on the lunar surface.
- **The erstwhile Soviet Union, the U.S. and China are the only countries to have achieved lunar landings.**
- Ever since the spacecraft left the U.R. Rao Satellite Centre in Bengaluru and was integrated with the GSLV MkIII launch vehicle around early July, 2019, the Satish Dhawan Space Centre at Sriharikota has been the hub of mission activities.
- During the journey, the lander rides on the parent spacecraft and the smaller rover nestles inside the lander. **The entire assembly weighs about 3,840 kg, according to ISRO.**
- The combined entity is programmed to function autonomously through the course of the mission. **Post-launch, the spacecraft's orbit will be gradually raised six times over 17 days before it is catapulted out of the earth's orbit towards moon.** The 3.84 lakh km journey will take five days, but the combined spacecraft must orbit the moon for about 28 days before the lander separates itself from the orbiter and descends on to the lunar terrain.
- The exercise would take 52 days, with the lander-rover combine programmed to reach the lunar terrain on September 6th, 2019.
- The rover would be launched from the lander after about four hours and would roam the terrain for about 500 m over the next 14 earth days — or one day on the moon.
- **Imaging, sampling the soil for minerals and water are some of the mission's tasks**.
- Information will be conveyed to earth through the orbiter or lander, and via the **Indian Deep Space Network** at Byalalu near Bengaluru.
- The solar-powered lander and the rover are not expected to last beyond one lunar day, but 100 km above the moon's surface, the orbiter will continue to scan lunar features for at least a year.
- ISRO's new 5,000-seater launch viewing gallery is expected to be packed with late-night onlookers. President Ram Nath Kovind is scheduled to visit the centre to witness the launch.

Category:INDIAN ECONOMY

1. Seed rights: Ministry notice to PepsiCo

Background:

- Recently, in Gujarat, food and beverages giant PepsiCo dragged potato farmers to court for allegedly growing its registered potato variety used to make 'Lays' chips.
- Four small farmers from Sabarkantha district were sued ₹1.05 crore each, although they cite a law allowing them to grow and sell even registered plant varieties.
- Faced with growing social media outrage, boycott calls from farmers groups and condemnation from major political parties, the company finally agreed to withdraw cases after talks with the Gujarat government.

When was the variety introduced?

- PepsiCo introduced, in 2009, the FC5 variety of potato that it uses to make its popular 'Lays' potato chips to India.
- The potato variety is grown by approximately 12,000 farmers who are a part of the company's collaborative farming programme, wherein the company sells seeds to farmers and has an exclusive contract to buy back their produce.
- In 2016, the company registered the variety under the Protection of Plant Varieties and Farmers' Rights Act, 2001 (PPV&FRA).
- Finding that farmers who were not part of its collaborative farming programme were also growing and selling potatoes of this variety in Gujarat, PepsiCo filed rights infringement cases under the Act against some farmers in Sabarkantha, Banaskantha and Aravalli districts in 2018 and 2019.
- Farmers allege that the company hired a private detective agency to pose as potential buyers, take secret video footage and collect samples from farmers' fields without disclosing its real intent.

What is the farmers' stand?

- The ₹4.2 crore lawsuit against four small farmers in Sabarkantha district was heard by an Ahmedabad commercial court on April 9, 2019 and an ex-parte injunction ordered against the farmers.
- However, farmers' rights groups across the country began a campaign against PepsiCo, requesting the Protection of Plant Varieties and Farmers' Rights Authority to intervene in the case and bear the farmers' legal costs using the National Gene Fund.
- At the April 26th, 2019 hearing, the company offered an out-of-court settlement to the farmers on the condition that they give an undertaking not to grow the registered variety and surrender existing stocks or to join its collaborative farming programme.
- Demanding an unconditional withdrawal of cases, farmers unions affiliated to the ruling Bharatiya Janata Party (BJP) as well as the Left parties joined in boycott calls against PepsiCo products and stoked outrage on social media as well.
- In the midst of an election season in which agricultural issues were in the spotlight, senior political leaders from the Congress and BJP added their criticism.
- On April 27, 2019, the Gujarat government announced that it would back the farmers and join the legal case on their behalf, although it later indicated it was working toward an out-of-court settlement.
- Finally, on May 2, 2019, PepsiCo agreed to withdraw all nine cases after discussions with the government.

What is the legal basis for the suit?

- Both PepsiCo and the farmers cite the same Act to support their opposing positions.
- The PPV&FRA was enacted in 2001 to comply with the World Trade Organisation's Agreement on Trade-Related Aspects of Intellectual Property Rights.
- PepsiCo based its suits on Section 64 of the Act dealing with infringements of the registered breeder's rights and subsequent penalties.
- The farmers' legal case depended on Section 39 of the Act, which allows the cultivator to "save, use, sow, resow, exchange, share or sell his farm produce including seed of a variety protected under this Act" with the sole exception of branded seed. As this section begins with the words "Notwithstanding anything contained in this Act…", farmers claim their rights have precedence.
- Over the last decade, more than 3,600 plant varieties have been registered under the Act, with more than half of the registration certificates going to farmers themselves. This was the first case of infringement of rights under the Act, according to the central agency set up to implement the Act.

Who were the stakeholders and what were the stakes?

- The farmers claimed that they bought potato seeds locally, and were within their rights to grow and sell any variety.

- Even PepsiCo supporters admitted that they lost the perception battle by dragging small farmers to court for large sums in election season.
- PepsiCo said its collaborative farming programme and registered variety rights were under threat.
- While 'Lays' claims to be a leader in the country's ₹5,500 crore potato chips market, regional players are eating into the market share.
- Farmers rights groups such as the Alliance for Sustainable and Holistic Agriculture saw the issue as a test case on farmers rights in India under the WTO regime, and warned that a bad precedent could hurt farmers of other crops and endanger the country's food sovereignty.
- Further, while farmers claimed victory, they also demanded an apology from PepsiCo and plan to sue for compensation for "harassment" by the company.
- They are also wary of any future government-facilitated negotiations on seed protection and the rights of breeders.
- Pepsico's decision to withdraw the cases was "backed by an assurance from the government for a long term amicable settlement", according to sources familiar with the development, who added that both the Gujarat government and the Centre were involved in that assurance for further talks.

What's in the news?

- In a recent development, **food and beverage giant PepsiCo India has been slapped with a notice from a Central agency under the Agriculture Ministry regarding an application to revoke the registration of its potato variety used to make its trademark Lays chips.**
- The notice was issued by the Protection of Plant Varieties and Farmers' Rights Authority on June 17, 2019. The company has been given three months to respond.
- According to sources, the application to revoke PepsiCo's registration argues that the firm violated Section 39 (1) (iv) clause of the PPV&FRA [the Protection of Plant Varieties and Farmers' Rights Act, 2001] when it sued the Gujarat potato farmers.
- This clause permits farmers to sow or even sell the produce of registered varieties, so long as they do not sell branded seed.
- The application reportedly evokes Section 34 (f) of the Act which allows the registration to be revoked on the grounds that the breeder has not complied with the provisions of this Act or rules or regulations made thereunder.
- The application also reportedly points out omissions from PepsiCo's original application for registration, which would be grounds for revocation under Section 34 (c).
- This move comes in the aftermath of PepsiCo's legal action in April, 2019 against at least nine potato farmers from Gujarat, who were sued for over ₹1 crore each for growing the potato variety registered by the company in 2016.
- Following public outrage and intervention by the Gujarat government, the company withdrew its cases in May, 2019.
- Farmers' union have also come together to prevent any future cases against farmers.
- Recently, major unions, including those affiliated to the BJP, gathered to draft an action plan.
- The Bharatiya Kisan Sangh plans to hold a national **"Quit India" protest** in August, 2019 to protect the seed rights of Indian farmers.

Category:ENVIRONMENT AND ECOLOGY

1. TIFR desalinates seawater without electricity

What's in the news?

- Using gold nanoparticles that absorb sunlight over the entire visible region and even the near infrared light, **researchers at the Tata Institute of Fundamental Research (TIFR), Mumbai, have been able to desalinate seawater to produce drinking water.**
- Unlike the conventional reverse osmosis that is energy intensive, **the gold nanoparticles require no external energy to produce potable water from seawater.**

A Closer Look:

- Using 2.5 mg of gold nanoparticles, the team from TIFR's Department of Chemical Sciences was able to use sunlight to heat the water to 85 degree C and generate steam to produce drinking water from seawater.
- Since the temperature reached is high, about 10% of seawater becomes steam (and hence drinking water) in about 30 minutes.
- **Alternatively, the gold nanoparticles can be used to convert carbon dioxide into methane.**
- This happens when the light absorbed by the gold nanoparticles excites the electrons, and the excited electrons when transferred into carbon dioxide converts it into methane in the presence of hydrogen. The hydrogen comes from the water that is used as a reaction solvent.
- At present, the conversion of carbon dioxide to methane is low — about 1.5 micromole per gram. It is desirable to increase the conversion one-fold to millimole range. The scientists are currently finding ways to improve the conversion rate. The results of the study were published in the journal Chemical Science.
- The gold nanoparticles decorate the surface of 3D fibrous silica nanosphere structure.
- The silica nanospheres measuring 400-500 nanometres are first functionalised with amines.
- In the presence of a reducing agent, the gold chloride gets deposited on the silica nanospheres.
- The gold nanoparticles were made bigger though cycles of deposition.
- The scientists used a different reducing agent that allows the gold to get deposited only on already formed nanospheres and not form new nanoparticles.
- It is important to note that a weak reducing agent does not allow gold to reach a critical concentration for it to form new nanoparticles. However, in certain channels of the fibrous material, the concentration of the gold precursors was sufficient to form new nuclei leading to the formation of new nanoparticles.
- The formation of smaller gold nanoparticles allows variation in size, which is essential for harvesting light. Each gold nanoparticle has an electron cloud on the surface that resonates with light.
- As the gold nanoparticles come closer when they grow bigger, the resonating electron cloud starts coupling together. This allows the gold nanoparticles to absorb light of different wavelengths — visible and near infrared light.
- Further, **while gold takes on different colours including red at nanometre size, it is not possible to make it black by simply changing the size of the nanoparticle.**
- Also, by changing the size and shape of gold nanoparticles scientists can tune the light absorption characteristic in the visible region.
- When scientists have plenty of gold nanoparticles in the vicinity of each other, they can achieve complete absorption of visible light leading to black colour.
- Further, it is important to note that **there is huge electromagnetic field and thermal heat produced about 1 nanometre around the gold nanoparticle. This is called a hotspot.**
- Such hotspots are present only when there is a gap between the gold nanoparticles.
- The gaps provide higher surface area. So more number of nanoparticles with gaps in between them are needed to generate more thermal hotspots.
- Finally, this is only a preliminary study. The next step should be to replace gold with some inexpensive metal to make it sustainable.

D. GS 4 Related

Nothing here for today!!!

E. Editorials

Category:INDIAN ECONOMY

1. Why is India opting for overseas bonds?

Background:

- The government, Finance Minister Nirmala Sitharaman announced in the Budget speech, plans to raise a portion of its gross borrowing from overseas markets.
- The government and the Reserve Bank of India (RBI) will reportedly finalise the plans for the overseas issue of sovereign bonds by September, 2019.
- While several commentators have argued that this is a risky move, the government itself is convinced that it will help boost private investment in the country.

Editorial Analysis:

What is an overseas bond issue?

- A government bond or sovereign bond is a form of debt that the government undertakes wherein it issues bonds with the promise to pay periodic interest payments and also repay the entire face value of the bond on the maturity date.
- So far, the government has only issued bonds in the domestic market.
- According to Ms. Sitharaman, India's sovereign external debt to GDP ratio is among the lowest around the world, at less than 5%.
- Against this background, the government will start raising a part of its gross borrowing programme in external markets in external currencies.
- This, she said, would also have a beneficial impact on the demand for government securities in India. The market estimates that the government will only test the waters and borrow about $10 billion, which works out to about 10% of its gross market borrowing.

What are the benefits of an overseas bond issue?

- The government has been arguing that the quantum of its borrowing within India is 'crowding out' the private sector.
- In other words, it is saying that government borrowing is at such a level that there are not enough funds available for the private sector to adequately meet its credit and investment needs.
- If the private sector cannot borrow adequately, then it cannot invest as it wants to, and that cripples one major engine of economic growth.
- According to Finance Secretary Subhash Chandra Garg, government borrowing accounts for about 80-85% of domestic savings. He also said that the overseas borrowing programme allows the government to maintain its gradual reduction of the fiscal deficit. Had the government listened to some commentators and relaxed its fiscal deficit to say 4.4%, then this would have allowed it to borrow an additional ₹2 lakh crore from the domestic market. However, this would have been ₹2 lakh crore that would not be available now to the private sector for borrowing purposes.
- Therefore, borrowing overseas allows the government to raise funds in such a way that there is enough domestic credit available for the private sector.

- It is important to note that the appetite of the international market for Indian bonds and their price will also say a lot about how India is viewed globally on the risk factor.
- For example, if the rate at which India can borrow overseas is low, then this would mean the global market assigns a low risk to India defaulting. This would undoubtedly be something the Narendra Modi government would take pride in.

What are the risks?

- Several economists have expressed their concerns over the fact that India might follow the path of some Central and South American countries such as Mexico and Brazil.
- In the 1970s, several of these countries borrowed heavily overseas when the global market was flush with liquidity. But then, when their currencies depreciated sharply a decade later, these countries were in big trouble as they could not repay their debt.
- India is not likely to be viewed as a risky proposition by the international market and so is likely to fetch an attractive rate for the bonds. Cheap and plentiful funds, however, should not encourage the government to borrow too heavily from abroad.
- Another risk to India from overseas borrowings is that this would lead to a quicker increase to its foreign exchange reserves, which would lead to a stronger rupee at a time when it is already appreciating against the dollar.
- This, many experts say, would be an adverse outcome. A stronger rupee would encourage imports at a time when the government is trying to curb them, and discourage exports at a time when they are being encouraged.
- On the other hand, a rupee depreciation for whatever external reason would prove even more disastrous as it would make it far more expensive for India to repay its external debt.
- The third problem with an overseas bond issue is that the government would not be able to inflate itself out of trouble.
- That is, in the domestic market, if the government does ever reach the stage where it is finding it difficult to repay its debt, it can simply print more money, let inflation rise quickly and repay its debt. This is not an option in an overseas bond issue. The Indian government cannot print foreign currency to repay its debt.

What does it mean for the domestic market?

- According to the government's own reasoning, there are not enough funds in the domestic market to cater to its needs as well as those of the private sector. This shallowness of the bond market is not a good thing, especially at a time when the government needs the bond market to finance several of its commitments.
- The Ujwal Discom Assurance Yojana (UDAY) scheme, for example, involves State governments taking over the debt of State power distribution companies and issuing bonds to repay that debt. Or take the government's Budget announcement of a further ₹70,000 crore capital infusion in public sector banks. A shallow bond market would make it difficult for the government to expand any of these schemes.
- Ideally, the government should have enough revenue that it does not need to borrow as much.
- However, at a time when both direct and indirect tax collections have disappointed, the government is forced to borrow to finance its expenditure.
- In such a scenario, it is a welcome move for the private sector that the government is leaving it room to borrow in the domestic market.

2. Registry for phones

Background:

- The National Telecom Policy of 2012 calls for the establishment of a National Mobile Property Registry to address the issue of "security, theft, and other concerns including reprogramming of mobile handsets".
- Based on this, the Department of Telecommunications (DoT) under the Ministry of Communications initiated a Central Equipment Identity Register (CEIR) for mobile service providers.
- The DoT issued a memorandum in July 2017 announcing the CEIR with a pilot project led by Bharat Sanchar Nigam Limited in Maharashtra.
- In January 2018, this project was handed over to the Centre for Development of Telematics (CDoT). Now, it is all set to roll out.

Editorial Analysis:

What is CEIR?

- Based on a 2008 order from the DoT, every mobile network provider in India has an Equipment Identity Register (EIR), or a database of the phones connected to its network.
- These EIRs will now share information with a single central database, the CEIR.
- In essence, it will be a repository of information on all mobile phones connected to networks across India.
- There were over 1,026 million active wireless phone connections by the end of 2018, according to the Telecom Regulatory Authority of India.
- As per the DoT's 2017 memorandum, the CEIR will have information on the device's International Mobile Equipment Identity (IMEI) number (every phone or mobile broadband device has this unique 15 digit code that precisely identifies the device), model, version, and "other information".
- It will also know if the phone is blacklisted, and the reason why it has been blacklisted.
- It is important to note that **phones are identified based on the IMEI number**, which one can find under the battery in many mobiles or by dialling '*#06#' on the device.
- Mobile phone manufacturers assign IMEI numbers to each device based on ranges allotted to them by the Global System for Mobile Communications Association.
- Dual SIM phones will have two IMEI numbers.

What is the purpose of a CEIR?

- Such centralised databases are meant to identify and block stolen or illegal mobile phones across networks.
- Currently, when a customer reports a mobile phone as missing or stolen, mobile service providers have the ability to blacklist the phone's IMEI in their EIRs and block it from accessing their network. But if the SIM is changed to a new network, it can continue to be in use.
- With a CEIR, all network operators will be aware that the phone is blacklisted.
- The CEIR will also access the GSMA's database of IMEI numbers to check whether the phone is authentic.
- There are cases of phones being in use with duplicate IMEI numbers, or with all zeroes instead of an authentic IMEI number.
- Most importantly, as per the DoT's 2017 memorandum, the CEIR will be able to block services to subscribers. This ability had rested with individual networks till now. The memorandum also mentions enabling "IMEI-based lawful interception", which means allowing legal authorities to use CEIR data.

What are the issues with having a CEIR?

- In its 2010 consultation paper on "issues relating to blocking of IMEI for lost/stolen mobile handsets," the Telecom Regulatory Authority of India (TRAI) raises a key issue with the CEIR — who should maintain such a high-value database? Should it be the service provider, or a neutral third party?
- In their responses to the consultation paper, many major service providers preferred having a third party, ranging from international bodies to TRAI itself as suggested by the BSNL.
- **The CDoT, which is reportedly readying to roll out the service, is an autonomous entity under the DoT.**
- Another major issue is cloning, or reprogramming stolen or unauthorised mobile phones to attach existing genuine IMEI numbers.
- Blocking cloned IMEI numbers could result in the authentic ones also being blocked.
- While the actual numbers on phones in circulation with cloned or inauthentic IMEIs are hard to pin down, Parliament, in 2012, was informed of two cases of 18,000 phones using the same IMEI number.
- In 2015, the government banned the import of mobile phones with fake IMEI numbers.
- In 2017, the DoT framed the "prevention of tampering of the Mobile Device Equipment Identification Number, Rules, 2017" that makes it punishable to tamper with the IMEI number of a device or knowingly use such a device.
- However, tools to reprogramme phones remain available online, and cases of such activities are reported frequently.
- On this issue, the DoT memorandum of 2017 says the IMEI Cloning and Duplication Restriction (ICDR) software is to be integrated in the CEIR.

Category:SCIENCE AND TECHNOLOGY

1. How will Chandrayaan 2 study the moon?

Background:

- When Chandrayaan 1, India's first moon mission was launched on October 22, 2008, from Sriharikota, using the Polar Satellite Launch Vehicle (PSLV), India became the fourth country to plant its flag on the lunar surface.
- On the moon, the mission conclusively detected traces of water along with magnesium, aluminium and silicon.
- Now, close to a decade later, India will launch its second lunar mission, Chandrayaan 2, on July 15, 2019, again from Sriharikota, using the Geosynchronous Satellite Launch Vehicle (GSLV) Mark III rocket.
- The launch falls a day short of the 50th anniversary of the launch of the American mission Apollo 11 which took humans to the moon and back.
- The first moon landing occurred on July 20, 1969, on the Apollo 11 mission which was launched on July 16.

Editorial Analysis:

How will the launch work?

- The GSLV Mark III rocket will first launch the spacecraft into an Earth Parking Orbit (170 km X 40,400 km).
- Then the height of the orbit will be enhanced until the spacecraft can reach out to the Lunar Transfer Trajectory.
- On entering the moon's sphere of influence, on-board thrusters will slow down the spacecraft, allowing it to be captured by the moon.

- Then it will be eased into a circular orbit (100 km X 100 km).
- From this orbit, the lander and rover will separate as a unit from the orbiter, and, through a series of braking mechanisms, the duo will "soft-land" on the moon, on September 6, 2019.

What is special about Chandrayaan 2?

- Chandrayaan 2 will be the first mission to reach and study the south pole of the moon.
- It is made up of an orbiter, a lander named 'Vikram', after Vikram A. Sarabhai, the founding father of space science research in India, and a rover named 'Pragyan', which means 'wisdom'.
- At about 3,877 kg, the spacecraft weighs nearly four times its predecessor, Chandrayaan 1.
- It will be launched by the GSLV Mark III, the Indian Space Research Organisation's (ISRO's) most powerful and massive launcher.
- While Chandrayaan 1 sent its lander crashing into the moon, Chandrayaan 2 will use rocket technology to soft land 'Vikram', carrying its 'Pragyan' rover in a suitable high plain on the lunar surface, between two craters, Manzinus-C and Simpelius N, at a latitude of about 70º South.
- This landing is scheduled for September 6th, 2019.
- The total cost of the project is about ₹978 crore. The lander-rover combo has an expected lifetime of 14 days, while the orbiter will continue for a year.

How does the 'Pragyan' rover operate and what determines its lifetime?

- The time taken for the moon to complete one rotation on its axis is approximately equal to 29.5 earth days. This is also equal to the time it takes to complete one orbit around the earth.
- That is why the same side always faces the earth. But because it takes 29.5 earth days to complete one rotation, every point on its surface experiences daylight for about half the time, or a little more than 14 days at a stretch. Moon days are nearly 14 earth days long.
- Note that the landing is scheduled for September 6th, 2019, when we will see the first quarter of the moon.
- This is a date when the lander will land at a point that is facing the earth and which has started receiving sunlight.
- This point will receive light for nearly another fortnight which will match the expected lifetime of the lander-rover combo.
- Since the 'Vikram' lander and 'Pragyan' rover are powered by solar energy, they will be energised during this period by sunlight on the moon.
- Once night falls, this energy will not be available as they are plunged into a dark and cold -180º Celsius environment.
- If the lander-rover duo should kickstart after another half-rotation when day breaks once again, it will be a bonus for the ISRO.
- It is important to note that the mission is not designed to survive this extreme cold, unlike some U.S. and Chinese missions which survived on the "dark" side of the moon using special sources of warmth.

How will the mission study the moon?

- Using the Terrain Mapping Camera 2 which is on board the orbiter, the mission will produce images of the moon remotely from a 100 km lunar polar orbit.
- While the moon rotates about its axis, along its east-west direction, say, the lunar polar orbit will be in the perpendicular direction, along the lunar north-south direction.
- Thus, as the moon rotates, the orbiter gets a view of its entire surface from overhead.
- This data collected by the orbiter will be used to produce a 3D image of the moon's terrain.
- This is just one of the eight instruments, or payloads, on board the orbiter.

- The lander carries three such payloads, some of which will measure the electron density and temperature near the lunar surface; the vertical temperature gradient, and seismicity around the landing site.
- The rover will carry two instruments or payloads which will collect and test samples from the moon's surface to identify what elements they contain.
- The rover moves on six wheels and once let down on the moon, can travel about 500 m from the lander.

What is the success rate of "soft-landing" on the moon?

- There have been 38 attempts so far at "soft-landing" on the moon, with a success rate of 52% according to the ISRO website.

Why should we have this mission? Why should we study the moon?

- The moon offers a pristine environment to study. It is also closer than other celestial bodies. Understanding how it formed and evolved can help us better understand the solar system and even earth itself.
- With space travel taking shape and exoplanets being discovered everyday, learning more about earth's celestial neighbour can help in advanced missions. Finally, it is a piece of the larger puzzle as to how the solar system and its planets have evolved.

F. Tidbits

1. WHC makes its displeasure known to Hampi authorities

What's in the news?

- Recently, **The World Heritage Committee**, which supervises and advises on conservation of UNESCO world heritage sites, has expressed regret at **the lack of response from local authorities on concerns about developmental projects in the world heritage site of Hampi.**
- The issue pertains to **road widening in the historical Kamalapur Tank area of Hampi**, which had been viewed with serious concern by the WHC at its 41st session at Krakow in 2017.
- The State party — Archaeological Survey of India and Hampi World Heritage Area Management Authority — had been given time till December 2018 to respond to the committee's observations.
- However, the Karnataka State party has not submitted a response, for which the WHC placed on record its "regret" at its 43rd session held in Baku, Azerbaijan.

2. Floods, landslips cause havoc in northeast

What's in the news?

- A bloating Brahmaputra has flowed into the Kaziranga National Park (KNP), **inundating 95 of the 200 rhino anti-poaching camps.**
- It is important to note that such camps, all on stilts to escape average flooding, are used by forest guards to watch over the 430 sq. km UNESCO World Heritage Site.

3. Black hole puzzle

What's in the news?

- The Hubble space telescope revealed the presence of a black hole at the centre of the galaxy NGC 3147 which is 130 million light years away that behaves differently from what is expected.
- While traditional theories postulated that its accretion disc would puff up like a doughnut, it was in fact flattened like that surrounding a more massive black hole.

4. Humans drive all-male elephant grouping

What's in the news?

- Environmental and anthropogenic factors have not just degraded elephant habitats and left them stressed, but also changed their social behaviour, notes a recent study conducted by the **National Institute of Advanced Studies (NIAS)**, Bengaluru.

What did the study reveal?

- The study revealed that there has been an increase in all-male elephant groups in the regions where landscape have been modified by humans.
- However, these elephants remained solitary or associated in mixed-age and mixed-sex groups within the forested areas.
- From February 2016 to December 2017, the researchers observed Asian elephants in a large area of nearly 10,000 sq. km, encompassing protected forested areas and human-use habitations including crop fields in Karnataka and Tamil Nadu.
- Using camera traps, they monitored the elephants that visit the nearby agricultural areas and those that stayed largely within the forests.
- Mature male elephants are known to move out from their herd to find nutritious forage to improve their reproductive health and also find a mate. But usually they roam around solo.
- The study found that in recent times the male elephants have started to form small groups.
- Since the landscape around them is changing drastically and not necessarily favourable — more roads, more electrical lines have come up — it becomes risky for the young males to be alone. So they have started associating with other male elephants and this helps them in multiple ways.
- The study notes that individuals familiar with the landscape help the group navigate better, find nutritious foraging sites and survive in the human-inhabited area. This has become a behavioural necessity for the young males in high-risk, high-resource landscape.
- The researchers found that these groups comprised of mixed age male elephants and their number also varied. The smallest was two and the largest male group comprised of 25 individuals.

Establishing Dominance:

- It is important to note that some of these elephants have been together for over 10 years.
- Further, experts have observed few sexual interactions among the males, they were not aimed at mating but mostly to establish dominance or bonding.
- It was also observed that most elephants from these groups moved long-distances into the forested areas and associated with females for reproduction and returned to the original male-group later.

Similar all-male groups are found in baboons, Asiatic and African lions. But this owes mostly to affiliations and establishing domination over mating.

- However, in elephants it's more about security or escaping the risk-areas.
- In conclusion, it is important to note that **these changes are purely environmental and not biologically influenced.** More studies are needed to fully understand such emerging behaviours. Decoding them may help frame new strategies to manage human–elephant conflict.

G. Prelims Facts

Nothing here for today!!!

H. UPSC Prelims Practice Questions

Q1. Consider the following statements :

1. Chandrayaan-2, India's second lunar mission, has three modules namely Orbiter, Lander (Vikram) & Rover (Pragyan).
2. The Orbiter and Lander modules will be interfaced mechanically and stacked together as an integrated module and accommodated inside the GSLV MK-III launch vehicle.
3. The Rover is housed inside the Lander.

Which among the above statements is/are ***correct***?

a) 1 and 2 Only
b) 2 and 3 Only
c) All 1, 2 and 3
d) 1 and 3 Only

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Ans: c

Explanation:

- Chandrayaan-2, India's second lunar mission, has three modules namely Orbiter, Lander (Vikram) & Rover (Pragyan).
- The Orbiter and Lander modules will be interfaced mechanically and stacked together as an integrated module and accommodated inside the GSLV MK-III launch vehicle.
- The Rover is housed inside the Lander.
- After launch into earth bound orbit by GSLV MK-III, the integrated module will reach Moon orbit using Orbiter propulsion module.
- Subsequently, Lander will separate from the Orbiter and soft land at the predetermined site close to lunar South Pole.
- Further, the Rover will roll out for carrying out scientific experiments on the lunar surface.
- Instruments are also mounted on Lander and Orbiter for carrying out scientific experiments.

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Q2. Consider the following statements with respect to the kingdom of 'Vijayanagara':

1. Krishnadeva Raya is credited with building some fine temples and adding impressive gopurams to many important south Indian temples. He also founded a suburban township near Vijayanagara called Nagalapuram after his mother.
2. Vijayanagara architecture is also known for its adoption of elements of Indo Islamic Architecture in secular buildings like the Queen's Bath and the Elephant Stables, representing a highly evolved multi-religious and multi-ethnic society.

Which among the above statements is/are ***correct***?

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

[su_dropcap]See[/su_dropcap][su_spoiler title="Answer"]

Ans: c

Explanation:

- Krishnadeva Raya is credited with building some fine temples and adding impressive gopurams to many important south Indian temples. He also founded a suburban township near Vijayanagara called Nagalapuram after his mother.
- Vijayanagara architecture is also known for its adoption of elements of Indo Islamic Architecture in secular buildings like the Queen's Bath and the Elephant Stables, representing a highly evolved multi-religious and multi-ethnic society.

[/su_spoiler]

Q3. Consider the following statements :

1. Black holes are volumes of space where gravity is extreme enough to prevent the escape of even the fastest moving particles. Not even light can break free, hence the name 'black' hole.
2. Stellar-mass black holes have been found scattered throughout the Milky Way and supermassive black holes containing millions to billions of times the mass of the Sun have been found inhabiting the Milky Way's center and the cores of most large galaxies.

Which among the above statements is/are ***correct***?

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

[su_dropcap]See[/su_dropcap][su_spoiler title="Answer"]

Ans: c

Explanation:

- Black holes are volumes of space where gravity is extreme enough to prevent the escape of even the fastest moving particles. Not even light can break free, hence the name 'black' hole.

- Stellar-mass black holes have been found scattered throughout the Milky Way and supermassive black holes containing millions to billions of times the mass of the Sun have been found inhabiting the Milky Way's center and the cores of most large galaxies.

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Q4. Consider the following statements :

1. GSLV Mk III is a three-stage heavy lift launch vehicle developed by ISRO. The vehicle has two solid strap-ons, a core liquid booster and a cryogenic upper stage.
2. GSLV Mk III will be capable of placing the 4 tonne class satellites of the GSAT series into Geosynchronous Transfer Orbits.

Which of the above statements is/are incorrect?

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

[su_dropcap]See[/su_dropcap][su_spoiler title="Answer"]

Ans: c

Explanation:

- GSLV Mk III is a three-stage heavy lift launch vehicle developed by ISRO. The vehicle has two solid strap-ons, a core liquid booster and a cryogenic upper stage.
- GSLV Mk III will be capable of placing the 4 tonne class satellites of the GSAT series into Geosynchronous Transfer Orbits.[/su_spoiler]

I. UPSC Mains Practice Questions

1. Chandrayaan 2 is yet another bold attempt being made by ISRO in the area of space research. Examine the uniqueness and importance of such a mission. (15 Marks, 250 Words)
2. The government and the Reserve Bank of India (RBI) will reportedly finalize the plans for the overseas issue of sovereign bonds. To what extent would this move by the government help boost private investment in the country? Examine. (15 Marks, 250 Words)