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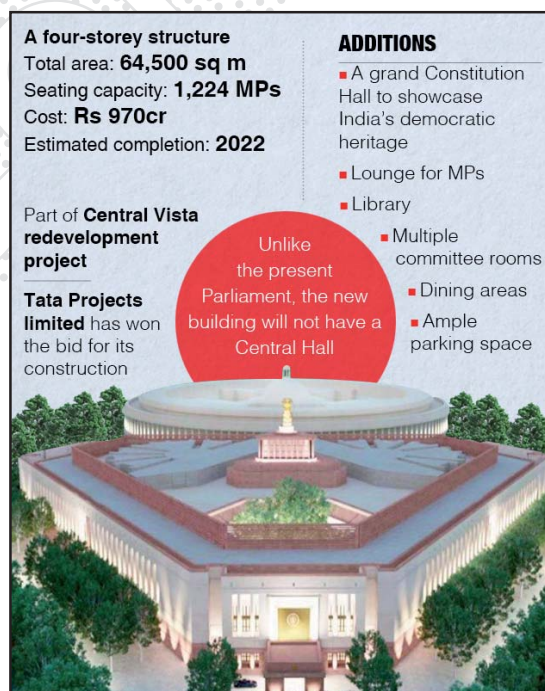
1 | New Parliament Building

CONTEXT:

- Prime Minister laid the foundation stone of the **New Parliament Building**.

ABOUT:

- The new building would be a four-storey structure with a seating capacity of 1,224 and cost Rs 970 crore.
- It would replace the existing colonial structure which would be completing hundred years in 2021.
- **Duration:** It is expected that the structure would be completed by 2022, coinciding with 75 years of India's independence.
- **Theme:** The theme of the new building would celebrate the cultural diversity of the country. It would also incorporate regional arts and crafts.
- Artisans and sculptures from across the country would be employed the complete the new structure making it a symbol of Atmanirbhar Bharat (self-reliant India).
- The building will not have the iconic Central Hall present in the existing structure.
- The new building will also have a grand Constitution Hall to showcase India's democratic heritage, a lounge for members of Parliament, a library, multiple committee rooms, dining areas and ample parking space.

What about the existing House?

- The existing Parliament House building will be suitably retro-fitted to provide more functional spaces for parliamentary events, to ensure its usage along with the new building.
- The existing building is a British era building, designed by **Edwin Lutyens and Herbert Baker** who were responsible for planning and construction of New Delhi.
- The Foundation Stone of the existing Parliament House was laid on February 12, 1921, and the construction took six years and cost Rs 83 lakh at that time.
- The opening ceremony was performed on January 18, 1927, by the then Governor-General of India, **Lord Irwin.**

A four-storey structure
Total area: **64,500 sq m**
Seating capacity: **1,224 MPs**
Cost: **Rs 970cr**
Estimated completion: **2022**

Part of **Central Vista redevelopment project**

Tata Projects limited has won the bid for its construction

Unlike the present Parliament, the new building will not have a Central Hall

ADDITIONS
- A grand Constitution Hall to showcase India's democratic heritage
- Lounge for MPs
- Library
- Multiple committee rooms
- Dining areas
- Ample parking space

2 | Promotion of Millets and Millet products

CONTEXT:

- Considering the potential of increasing exports of Millets and Millet products and the focus given by Government for development of Millet sector of Nurti-Cereals, APEDA is formulating a strategy with FPOs for perspective planning of five years for promotion of Millets and Millet products.

What is the plan?

- APEDA is preparing a perspective Action Plan for increasing export of Millet and Millet Products for a period five years i.e. 2021-2026 to enable all concerned stakeholders for taking necessary action in a time bound manner for achieving the target.
- Further, efforts would be made on identification of Millet clusters, creation of platform to consolidate farmers, FPOs, Exporters, Associations, other stakeholders and identification of new Potential International Markets for promotion of Indian Millets.
- Increasing interest in reviving the consumption of millets across various countries is favoring the growth prospects of this product in recent years within the country and for exports as well.

What is Millet?

- Millet is a common term to categorize small-seeded grasses that are often termed nutri-cereals, and includes Sorghum, Pearl Millet, Ragi, Small Millet, Foxtail Millet, Proso Millet, Barnyard Millet, Kodo Millet and other millets.
- Millets are the cereal crops generally small-seeded and known for high nutritive value.

Agricultural and Processed Food Products Export Development Authority (APEDA):

- ➤ Agricultural and Processed Food Products Export Development Authority (APEDA) is an apex body under the Ministry of Commerce and Industry, Government of India, responsible for the export promotion of agricultural products.
- ➤ The Agricultural and Processed Food Products Export Development Authority (APEDA) was established by the Government of India under the Agricultural and Processed Food Products Export Development Authority Act passed by the Parliament in December, 1985.
- ➤ The Authority replaced the Processed Food Export Promotion Council (PFEPC).

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3 | Online Dispute Resolution(ODR)

CONTEXT:

- NITI Aayog and Patna High Court initiated a drive for the use of technology to advance Access to Justice through Online Dispute Resolution(ODR)

ABOUT:

- ODR is the resolution of disputes, particularly small and medium value cases, using digital technology and techniques of alternate dispute resolution (ADR), such as negotiation, mediation, and arbitration.
- While courts are becoming digitized through the efforts of the judiciary, more effective, scalable, and collaborative mechanisms of containment and resolution are urgently needed.
- ODR can help resolve disputes efficiently and affordably.

Alternative dispute resolution (ADR):

- ➤ Alternative dispute resolution (ADR) refers to a variety of processes that help parties resolve disputes without a trial.
- ➤ Typical ADR processes include mediation, arbitration, neutral evaluation, and collaborative law.

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4 | National Family Health Survey-5

CONTEXT:

- Union Minister of Health and Family Welfare, Government of India, released the Factsheets of key indicators on population, reproductive and child health, family welfare, nutrition and others for 22 States/UTs of the first Phase of the 2019-20 National Family Health Survey (NFHS-5) on **Universal Health Coverage Day** .

ABOUT:

- The main objective of successive rounds of the NFHS is to provide reliable and comparable datasets on health, family welfare and other emerging issues.
- Four rounds of NFHS (1992–93, 1998–99, 2005–06 and 2015–16) have been successfully completed in India.
- All the rounds of NFHS have been conducted by the International Institute for Population Sciences (IIPS), Mumbai, as the national nodal agency.

The key results from the State/UT factsheets are as follows:

- **Total Fertility Rate:** The Total Fertility Rates (TFR) has further declined since NFHS-4 in almost all the Phase-1 States and UTs. The replacement level of fertility (2.1) has been achieved in 19 out of the 22 States/UTs and only 3 states viz. Manipur (2.2), Meghalaya (2.9) and Bihar (3.0) have TFR above replacement levels now.
- **Contraceptive Prevalence Rate (CPR):** Overall Contraceptive Prevalence Rate (CPR) has increased substantially in most States/UTs and it is the highest in HP and WB (74%). Use of modern methods of contraception has also increased in almost all States/UTs.
- **Immunization drive:** Full immunization drive among children aged 12-23 months has recorded substantial improvement across States/UTs/districts.

- More than two-third of children are fully immunized in all the States and UTs except Nagaland, Meghalaya and Assam.

- In almost three-fourths of districts, 70% or more children aged 12-23 months are fully immunized against childhood diseases.

- On comparing NFHS-4 and NFHS-5 data, the increase in full immunization coverage is observed to be expeditious in many states and UTs. This can be attributed to the flagship initiative of Mission Indradhanush launched by the government since 2015.

- **Institutional births**: Institutional births have increased substantially with over four-fifth of the women delivering in institutions in 19 States and UTs. Institutional delivery is over 90 per cent in 14 out of the total 22 Sates and UTs.

  - Almost 91% of districts recorded over 70% institutional deliveries of births in the 5 years preceding the survey.

  - Along with an increase in institutional births, there has also been a substantial increase in C-section deliveries in many States/UTs especially in private health facilities.

- **Sex ratio:** Sex ratio at birth has remained unchanged or increased in most States/UTs. Majority of the states are in normal sex ratio of 952 or above. SRB is below 900 in Telangana, Himachal Pradesh, Goa, DNH & DD.

- **Child nutrition:** Child nutrition indicators show a mixed pattern across states. While the situation improved in many States/UTs, there has been minor deterioration in others. Drastic changes in respect of stunting and wasting are unlikely in a short period.

- **Women empowerment:** Women's empowerment indicators portray considerable improvement across all the States/UTs included in Phase 1. Considerable progress has been recorded between NFHS-4 and NFHS-5 in regard to women operating bank accounts. For instance, in the case of Bihar the increase was to the tune of 51 percentage point from 26 per cent to 77 per cent.

  - More than 60 per cent of women in every state and UTs in the first phase have operational bank accounts.

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5 | Intellectual Property Cooperation

CONTEXT:

- India, USA sign MoU on Intellectual Property cooperation.

ABOUT:

- The Union Cabinet gave the approval for signing the MoU with United States Patent and Trademark Office (USPTO) in the field of IP Cooperation.

The MoU aims at increasing IP co-operation between the two countries by way of:

- Facilitating exchange and dissemination of best practices, experiences and knowledge on IP among the public, and between and among the industry, universities, research and development (R & D) organizations, and Small and Medium-sized Enterprises through participation in programs and events organized singly or jointly by the Participants;

- Collaboration in training programs, exchange of experts, technical exchanges and outreach activities;

- Exchange of information and best practices on processes for registration and examination of applications for patents, trademarks, copyrights, geographical indications, and industrial designs, as well as the protection, enforcement and use of IP rights;

- Exchange of information on the development and implementation of automation and modernization projects, new documentation and information systems in IP and procedures for management of IP Office services;

- Cooperation to understand various issues related to traditional knowledge, and the exchange of best practices, including those related to traditional knowledge databases and awareness raising on the use of existing IP systems for the protection of traditional knowledge; and

- Other cooperation activities as may be mutually decided by the Participants.

SIGNIFICANCE:

- The MoU will go a long way in fostering the cooperation between India and USA, and provide opportunities to both countries to learn from the experience of each other, especially in terms of best practices followed in the other country.

- It will be a landmark step forward in India's journey towards becoming a major player in global innovation and will further the objectives of National IPR Policy, 2016.

> **National IPR Policy**
>
> ➤ The Union Cabinet approved the National Intellectual Property Rights (IPR) Policy in 2016 that shall lay the future roadmap for IPRs in India.
>
> ➤ The Policy recognises the abundance of creative and innovative energies that flow in India, and the need to tap into and channelize these energies towards a better and brighter future for all.
>
> ➤ The National IPR Policy is a vision document that encompasses and brings to a single platform all IPRs.
>
> ➤ It views IPRs holistically, taking into account all inter-linkages and thus aims to create and exploit synergies between all forms of intellectual property (IP), concerned statutes and agencies.
>
> ➤ It sets in place an institutional mechanism for implementation, monitoring and review.
>
> ➤ It aims to incorporate and adapt global best practices to the Indian scenario.

6 | Indo-Nepal Link Canal

CONTEXT:

- NHPC lays the foundation stone of head regulator works of **Indo-Nepal Link Canal.**

ABOUT:

- The Indo-Nepal Link Canal project comprise of constructing a Head Regulator on the left bank of existing Tanakpur Barrage and diverting its water into irrigation canal to Nepal.

- The 1.2 km long Indo-Nepal canal is being constructed under 'Mahakali Treaty' signed between India and Nepal.

- The proposed Indo Nepal Link canal envisages construction of irrigation canal originating from Tanakpur barrage and runs on the left bank of the river at almost perpendicular to Sharda River.

- It eventually connects to Nepal Canal after crossing Indian Territory.

Mahakali Treaty:

➤ It is an agreement between the Government of Nepal and the Government of India regarding the development of watershed of Mahakali River.

➤ The treaty was signed in 1996.

➤ The treaty has 12 articles agreements for an integrated development of barrage, dams and hydropower for mutual cooperation of the two countries by managing the water resources.

➤ The treaty recognizes the Mahakali River as a boundary river between the two countries.

7	**Passage Exercise (PASSEX)**

CONTEXT:

● The Indian Navy (*IN*) undertook a Passage Exercise (PASSEX) with Russian Federation Navy (RuFN) in the Eastern Indian Ocean Region (IOR).

ABOUT:

- The exercise was aimed at enhancing interoperability, improving understanding and imbibing best practices between both the friendly navies, and would involve advanced surface and anti-submarine warfare exercises, weapon firings, seamanship exercises and helicopter operations.
- PASSEXs are conducted regularly by *IN* with units of friendly foreign navies, whilst visiting each other's ports or during a rendezvous at sea.
- This exercise, was conducted in the Eastern Indian Ocean Region, reflects the strong long-term strategic relationship between the two countries and particularly, defence cooperation in the maritime domain.
- This PASSEX was another step towards strengthening Indo-Russian defence relations.
- The two navies have built a robust relationship through regular exercises such as INDRA Navy conducted biennially, with the last edition held in the Northern Indian Ocean Region.

8 PM-KUSUM Scheme

CONTEXT:

- Ministry of New and Renewable (MNRE), after consultation with state governments, has decided to issue Guidelines for Implementation of Feeder Level Solarisation under Component-C of PM-KUSUM Scheme.

ABOUT:

- The Cabinet Committee on Economic Affairs had approved PM-KUSUM scheme in 2019. The Scheme consists of three components.
- **Component-A** includes installation of Decentralized Ground Mounted Grid Connected Renewable Power Plants,
- **Component-B** includes installation of standalone Solar Powered Agriculture Pumps
- **Component-C** includes Solarisation of Grid-connected Agriculture Pumps.
- As per provisions of the PM-KUSUM Scheme, the grid connected agriculture pumps can be solarised with central and state subsidy of 30% each and farmer's contribution of 40%.
- The solar capacity allowed is upto two times of the pump capacity in kW and surplus power will be purchased by DISCOM.
- The objective of Component-C of PM-KUSUM Scheme is to provide reliable day-time power to farmers, enhancing their income by purchasing surplus solar power and thus incentivising them for saving water.
- In case of feeder level solarisation, farmers will get daytime reliable solar power for irrigation, but there is no provision of selling surplus solar power. Therefore, farmers can be incentivised for saving water and enhancing their income.
- The DISCOMs shall assess the average power requirement by farmers of an area depending upon various factors. This power requirement will be treated as their benchmark consumption.
- The DISCOMs shall incentivise farmers for consuming power less than benchmark consumption.

> **Solar power in India**
>
> ► Solar power in India is a fast developing industry. The country's solar installed capacity was 35,739 MW as of 31 August 2020.
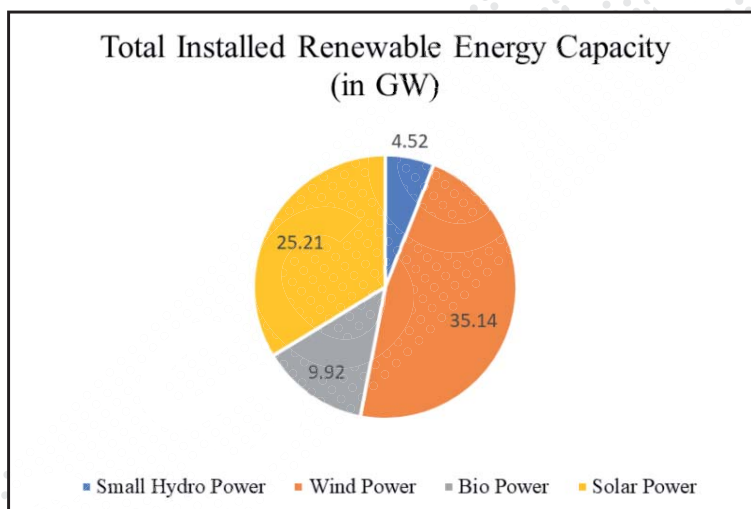
> ➤ The Indian government had an initial target of 20 GW capacity for 2022, which was achieved four years ahead of schedule.
>
> ➤ Rooftop solar power accounts for 2.1 GW, of which 70% is industrial or commercial.
>
> **National Solar Mission**
>
> ➤ The objective of the National Solar Mission is to establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible.
>
> ➤ Under the original plan, the Government aimed to achieve a total installed solar capacity of 20 GW by 2022.
>
> **The International Solar Alliance (ISA)**
>
> ➤ The International Solar Alliance (ISA) is an alliance of 121 countries initiated by India, most of them being sunshine countries, which lie either completely or partly between the Tropic of Cancer and the Tropic of Capricorn.
>
> ➤ The primary objective of the alliance is to work for efficient consumption of solar energy to reduce dependence on fossil fuels.

Total Installed Renewable Energy Capacity (in GW)

4.52 — Small Hydro Power
35.14 — Wind Power
9.92 — Bio Power
25.21 — Solar Power

9 Scheme for Hygiene Rating Audit Agencies

CONTEXT:

- Quality Council of India (QCI) at the behest of the FSSAI has come out with a Scheme for approval of Hygiene Rating Audit Agencies to scale up Hygiene Rating by increasing the number of recognised Hygiene Rating Audit Agencies in the country.

ABOUT:

- FSSAI's initiative of 'Food Hygiene Rating Scheme' is a certification system for food businesses supplying food directly to consumers, either on or off premise.
- The food establishments are rated based on food hygiene and safety conditions observed at the time of audit.
- The hygiene rating will be in the form of smileys (1 up to 5) and the certificate should be displayed prominently in the consumer facing area. The recognised Hygiene Rating Audit Agencies will be

responsible for verifying the compliance with food hygiene and safety procedures laid by FSSAI and get Hygiene Rating.

- The scheme aims to allow consumers to make informed choices/decisions pertaining to the food outlets where they eat by encouraging food businesses to improve their hygiene and safety standards.

- Currently, this scheme is applicable for Food service establishments (such as hotels, restaurants, cafeteria, dhabhas, etc), sweet shops, bakeries and meat retail stores.

- The recognised Hygiene Rating Audit Agency will verify the compliance with food hygiene and safety procedures laid by FSSAI.

The Quality Council of India (QCI)

➤ Post liberalization, India embarked on a process of creating the quality infrastructure in the country which can help Indian products and services easy access to foreign markets in the new order under WTO regime.

➤ In the process, an organization was sought to be established which would function as the National Accreditation body (NAB).

➤ The responsibility to set up the organization was given to the then Department of Industries (now Department for Promotion of Industry and Internal Trade (DPIIT).

➤ The Quality Council of India (QCI) was set up as a public private partnership model on the model existing in Netherlands at the time, where although the NAB was not owned by the government, yet it was supported by it and was exceedingly used as a third party agency to improve quality in departments and industry.

➤ QCI thus, came to be organized as an independent autonomous body that worked towards assuring quality standards across all spheres of economic and social activities.

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10 | Draft Indian Ports Bill, 2020

CONTEXT:

- Ministry of Ports, Shipping and Waterways has circulated draft of Indian Ports Bill 2020 for public consultation which will repeal and replace the Indian Ports Act, 1908.

ABOUT:

- The draft Indian Ports Bill, 2020, seeks to, *inter alia,* enable the structured growth and sustainable development of ports to attract investments in the Port sector for optimum utilisation of the Indian Coastline by effective administration and management of ports.

- The proposed Bill will provide measures to facilitate conservation of ports, taking into account the prevalent situation with respect to the high number of non-operational ports.

- It shall further ensure greater investment in the Indian maritime and ports sector through the creation of improved, comprehensive regulatory frameworks for the creation of new ports and management of existing ports.

- The Bill also seeks to, *inter alia*, create an enabling environment for the growth and sustained development of the ports sector in India through the following broad methods:

  ◉ Constitution of *Maritime Port Regulatory Authority*

  ◉ Formulation of the National Port policy and National Port plan in consultation with Coastal State Governments, State Maritime Boards and other stakeholders.

- ◉ Formulation of specialised Adjudicatory Tribunals namely Maritime Ports Tribunal and Maritime Ports Appellate Tribunal to curb any anti-competitive practises in the port sector and act as a speedy and affordable grievance redressal mechanism.

- The up-to-date provisions of the proposed Bill would ensure safety, security, pollution control, performance standards and sustainability of Ports.

- The Bill ensures that all up-to-date conventions /protocols to which India is a party, are also suitably incorporated. This will promote marine safety and security in the true sense. The Bill will fill up the gaps for achieving scientific development of Ports and Port Network.

- The Bill seeks to provide increased opportunities for public and private investments in the Indian maritime and ports sector by way of removing barriers to entry, simplifying processes and establishment of agencies and bodies to plan and enable growth of the ports sector.

- Enhancing "Ease of Doing Business', it will provide greater impetus to a self-reliant domestic investment climate in the maritime sector, towards Atamanirbhar Bharat initiatives of the Government.

11 | Dedicated Export Promotion Council for Technical Textiles

CONTEXT:

- Ministry of Textiles invites proposals for constitution of a Dedicated Export Promotion Council for Technical Textiles

ABOUT:

- The Council shall abide by all directions of the Central Government in respect of promotion and development of international trade and would be responsible to promote ITC(HS) lines identified and Notified by Directorate General of Foreign Trade from time to time.

- The Cabinet Committee on Economic Affairs, in its meeting held on 26th February, 2020, gave its approval to set up a National Technical Textiles Mission with a view to position the country as a global leader in Technical Textiles.

- The Mission would have a four year implementation period from FY 2020-21 to 2023-24.

- Constitution of an Export Promotion Council for Technical Textiles is part of one of the components of the **National Technical Textiles Mission**.

- Technical Textiles are futuristic and nice segment of textiles, which are used for various applications ranging from agriculture, roads, railway tracks, sportswear, health on one end to bullet proof jackets, fire proof jackets, high altitude combat gear and space applications on other end of spectrum.

Background of Technical Textiles:

- Technical textiles are textiles materials and products manufactured primarily for technical performance and functional properties rather than aesthetic characteristics.

- India shares nearly 6% of world market size of 250 Billion USD. However, the annual average growth of the segment is 12%, as compared to 4% world average growth.

- Penetration level of technical textiles is low in India at 5-10%, against 30-70% in advanced countries.

- The Mission aims at improving penetration level of technical textiles in the country.

Technical Textiles Mission in India:

➤ To increase the penetration level of technical textiles in India while leveraging the extraordinary growth rate of the sector, the Ministry of Textiles has launched the National Technical Textiles Mission.

➤ The aim of the mission is to position India as a global leader in Technical Textiles. It also supports the 'Make in India' initiative promoting domestic manufacturing of related machinery and equipment.

The mission will comprise of the following four components:

➤ Research, Innovation and Development

➤ Promotion and Market Development

➤ Export Promotion

➤ Education, Training, Skill Development

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12 The International Financial Services Centres Authority (IFSCA)

CONTEXT:

- IFSCA obtains Membership of International Association of Insurance Supervisors (IAIS)

ABOUT:

- Established in 1994, the IAIS headquartered in Switzerlandis a voluntary membership organization of insurance supervisors and regulators from more than 200 jurisdictions, constituting 97% of the world's insurance premiums.

- It is the international standard-setting body responsible for developing and assisting in the implementation of principles, standards and other supporting material for the supervision of the insurance sector.

- The IAIS also provides a forum for Members to share their experiences and understanding of insurance supervision and insurance markets.

- In recognition of its collective expertise, the IAIS is routinely called upon by the G20 leaders and other international standard setting bodies.

Leading members of IAIS

- **Some of the leading members of IAIS are**

  ◉ United Kingdom- Financial Conduct Authority (FCA)

  ◉ USA- National Association of Insurance Commissioners (NIAC)

  ◉ USA- Federal Insurance Office of the Insurance of the United States Department of Treasury (FIO)

  ◉ Singapore- Monetary Authority of Singapore (MAS)

  ◉ India- Insurance Regulatory and Development Authority of India (IRDAI)

Significance of the membership

- With this membership IFSCA would have access to IAIS's global network and would be able to exchange ideas and information with other global regulators.

- This would help in developing a vibrant global Insurance hub in IFSC at GIFT City. Currently, 17 leading Insurance entities are operating from GIFT IFSC undertaking offshore Insurance and Reinsurance business.

- This membership would go a long way in connecting IFSC with global insurance institutions and would facilitate IFSCA in joint development of global insurance business with other global centres.

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13 | High-level Ministerial Committee for implementation of Paris Agreement

CONTEXT:

- In move that re-affirms India's seriousness to 'walk the talk' on climate change, the Ministry of Environment, Forest and Climate Change (MoEFCC) has constituted a high-level inter-ministerial Apex Committee for Implementation of Paris Agreement (AIPA) under the chairmanship of Secretary, MoEFCC.

ABOUT:

- The purpose of AIPA is to generate a coordinated response on climate change matters that ensures India is on track towards meeting its obligations under the Paris Agreement including its Nationally Determined Contributions (NDC).

- Senior officials from fourteen ministries will serve as Members to AIPA who will oversee the progress in implementation of India's NDC and receive periodic information updates to monitor, review and revisit climate goals to fulfill the requirements of the Paris Agreement.

- Another key function of AIPA would be to operate as a National Authority to regulate carbon markets in India under Article 6 of the Paris Agreement, formulate guidelines for consideration of projects or activities under Article 6 of the Paris Agreement, issue guidelines on carbon pricing, market mechanism, and other similar instruments that have a bearing on climate change and NDCs.

- It will take note of the contributions of the private sector as well as multi-/bi-lateral agencies in the field of climate change and provide guidance for aligning their climate actions with national priorities.

- The year 2021 would mark the beginning of implementation of the Paris Agreement and constitution of AIPA is central to strengthening the national systems and institutional arrangements for implementation and monitoring of climate actions.

- It will also ensure that India maintains its climate leadership as one the few countries in the world whose climate actions are consistent with the goals of the Paris Agreement.

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14 | Fourth South Asia Forum on SDGs

CONTEXT:

- In the backdrop of the 4th South Asian Forum of Sustainable Development Goal (SDG), UNESCAP South Asia and Pacific virtually organised a special dialogue on disaster and climate resilience.

ABOUT:

- The key objectives of the High Level meeting were to identify the opportunities and imperatives to overcome the challenges in implementing the systemic approach to disaster and public health risk management.

- In addition, other objectives were to formulate the strategies for capitalizing on existing regional and sub-regional cooperation mechanism including the South Asian Forum on SDG to scale up multi-hazard and multi-sectoral preparedness systems for future cascading disasters.

South Asian Forum of Sustainable Development Goal (SAFSD):

➤ SAFSD has been conceived as the subregional preparatory for APFSD and was launched in 2017 in Kathmandu.

➤ SAFSD seeks to strengthen the policy environment that supports the integration of the three dimensions of sustainable development by ensuring subregional perspectives on follow up and review of the 2030 agenda are articulated and well reflected in all relevant regional and global processes.

SAFSD specifically aims to:

➤ Enhance awareness and understanding on key challenges and opportunities for the implementation of the 2030 Agenda and the regional roadmap to support and complement the subregional agenda through sharing of experiences and knowledge.

➤ Provide a platform for expert discussions and reflections on subregional perspectives and good practices on the cluster of Goals under review at the High-Level Political Forum (HLPF) and APFSD in the following year.

➤ Support capacity building for countries in the subregion ahead of their Voluntary National Review (VNR) presentations.

➤ Identify ways, through expert discussions to strengthen implementation efforts, stakeholder engagement, follow-up and review, linking national, subregional, regional and global processes.

➤ Identify needs and opportunities for regional cooperation and delivery by regional and subregional bodies and the United Nations Development System

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15 | A tough novel species of Muraingrass identified

CONTEXT:

- A tough novel species of Muraingrass identified by scientists in the plateaus of Western Ghats of Goa

ABOUT:

- A new species of Indian Muraingrasses known for their ecological and economic importance, such as fodder, have been spotted by scientists in Goa in the Western Ghats, one of the four global biodiversity hotspots of India.

- The species has adapted to survive harsh conditions, low nutrient availability, and blossoms every monsoon.

- Globally 85 species are known from Ischaemum, of which 61 species are exclusively found in India. The Western Ghats have 40 species with the highest concentration of the genus.

- The first collection of this new species was made in the 2017 monsoon. The population was kept under observation for the next two years to confirm the consistency of its characters. Morphological and molecular data of the species were used to confirm the novelty of the species.

- Ischaemumjanarthanamii grows on low altitude lateritic plateaus in the outskirts of Bhagwan Mahavir National Park, Goa. The vegetation is exposed to extreme climatic conditions like desiccation in drier months and soils with low nutrient availability. However, withstanding these, the species has adapted to survive harsh conditions and blossom every monsoon.

- The species was named Ischaemumjanarthanamiiin honour of Prof. M. K. Janarthanam, Professor of Botany, Goa University, for his contribution to the Indian grass taxonomy and documentation of the floristic diversity of Goa state.
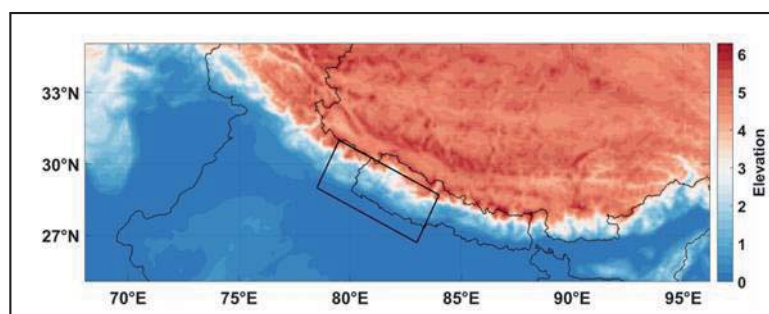
16 Aerosols in Indo-Gangetic Plain

CONTEXT:

- Aerosols in Indo-Gangetic Plain have led to increased incidents of high rainfall in the Himalayan foothills.

ABOUT:

- The Indo-Gangetic Plains located south and upwind of the Himalayan foothills. The region is associated with high aerosol loading, much of which is black carbon and dust, and thus provides an opportunity for studying how aerosol affects extreme rainfall events, particularly when air mass is forced from a low elevation to a higher elevation as it moves over rising terrain technically called orographic forcing.

- They showed that particulate emissions can alter the physical and dynamical properties of cloud systems and, in turn, amplify rainfall events over orographic regions downwind of highly polluted urban areas.

- The team found clear associations between high precipitation events, high aerosol loading, and high moist static energy (MSE) values (Moist static energy of an air mass includes the potential energy due to its height above the ground and the latent heat due to its moisture content).

- The findings also highlight the crucial role of the radiative effect of aerosol on high precipitation events over the Himalayan region.

- The results of the study indicate that aerosols can play a vital role in exciting high precipitation (HP) events over the Himalayas during the monsoon season. Thus, aerosols, including chemistry, are essential to consider when forecasting HP events over the Himalayan region in regional modelling studies.

Aerosol

➤ An aerosol is a suspension of fine solid particles or liquid droplets in air or another gas.

➤ Aerosols can be natural or anthropogenic.

➤ Examples of natural aerosols are fog, mist, dust, forest exudates and geyser steam. Examples of anthropogenic aerosols are particulate air pollutants and smoke.

17 BrahMos

CONTEXT:

- Successful Test Firing of BrahMos by Indian Navy

ABOUT:

- The test firing was carried out by Indian Navy. The missile performed highly complex manoeuvres and hit Bull's eye of the target.

- BrahMos is the supersonic cruise missile jointly developed by DRDO and NPOM of Russia as a Brahmos Aerospace joint venture, which became Brahmos Aerospace Private Limited.

- The missile has established itself as a major force multiplier in modern-day complex battlefields with its impeccable anti-ship and land-attack capabilities with multi-role and multi-platform abilities and has been deployed in all the three wings of the Indian Armed Forces.

- The first launch of Brahmos took place in 2001 and till date numerous launches have taken place from various ships, Mobile Autonomous Launchers and Su-30 MKI aircraft, making it a versatile weapon.

The BrahMos

➤ The BrahMos is a medium-range ramjet supersonic cruise missile that can be launched from submarine, ships, aircraft, or land.

➤ It is the fastest supersonic cruise missile in the world.

➤ It is a joint venture between the Russian Federation's NPO Mashinostroyeniya and India's Defence Research and Development Organisation (DRDO), who together have formed BrahMos Aerospace.

➤ The name BrahMos is a portmanteau formed from the names of two rivers, the Brahmaputra of India and the Moskva of Russia.

Russian-Indian BrahMos supersonic cruise missile

The BrahMos anti-ship missile was jointly developed by Russia's Engineering Research and Production Association (NPO) and the Indian Defense Ministry's Defense Research and Development Organization (DRDO)

Specifications

Lift-off weight:	**3,000 kg** (sea-launched version), **2,500 kg** (air-launched version)
Warhead:	**Up to 300 kg**
Flight altitude	**From 5 to 14,000 meters**
Maximum speed:	**Mach 2.8**
Diameter:	**70 cm**
Wingspan:	**1.7 meters**
Range:	**290 km**

The missile rapidly loses altitude while approaching its target and thus evades ship-based air-defense systems

Various flight paths

Designation

The missile is designed to hit all classes of warships

The missile is fired from mobile self-contained launchers installed onboard submarines, warships and fixed-wing aircraft

History and prospects

The BrahMos Aerospace Private Limited joint venture was established in 1998 and started working on the project

Twenty successful tests were conducted

The Indian Air Force has already adopted the missile

BrahMos Aerospace is ready to enter the international market. Prospective clients include 14 countries

The Indian Air Force requires 1,000 BrahMos missiles

In all, 2,000 Brahmos missiles can be exported

There are plans to develop the hypersonic BrahMos missile with a speed of Mach 5
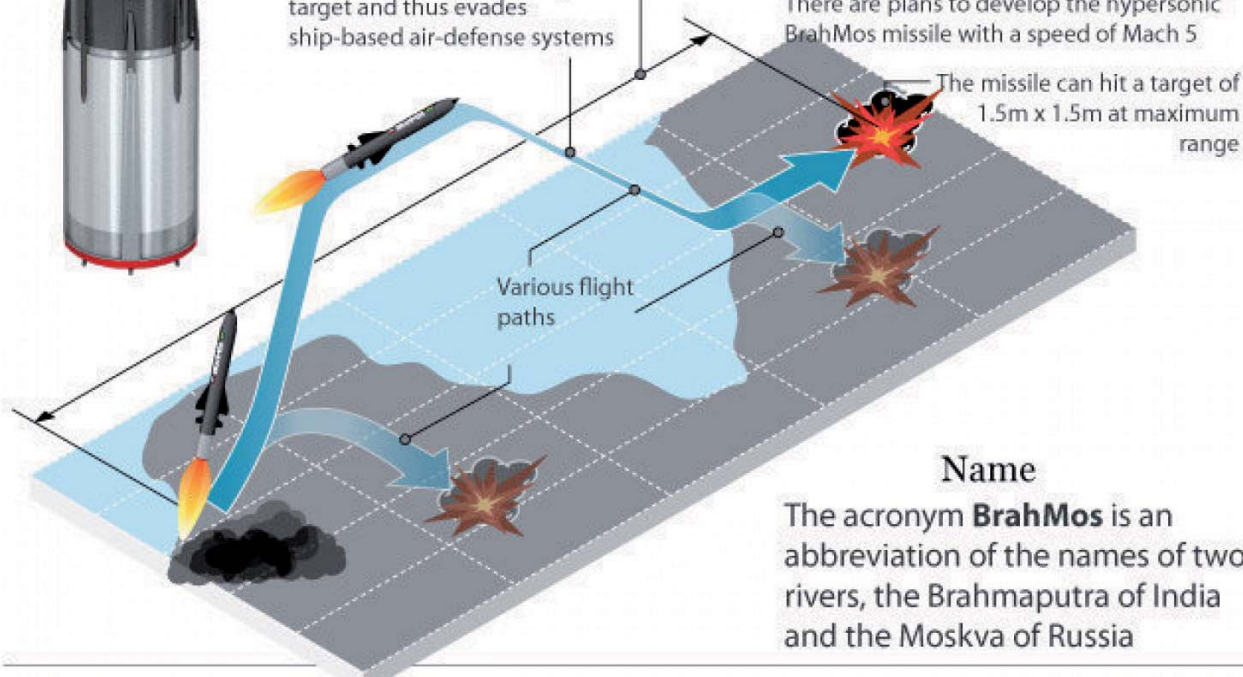
The missile can hit a target of 1.5m x 1.5m at maximum range

Name

The acronym **BrahMos** is an abbreviation of the names of two rivers, the Brahmaputra of India and the Moskva of Russia

18 | Towards decoding light emission down to single-photon

CONTEXT:

- Scientists are working towards understanding the light emission down to a single elementary particle called photon for improving quantum technologies.

ABOUT:

- Spontaneous emission can be tailored by precise engineering of the photon density of states of the elementary particles called photon using photonic structures or periodically ordered patterns; like that in a peacock feather.
- These structures act as a powerful tool to control the emission and propagation of light.
- Hence, the emission properties of quantum emitters that can even emit single photons can be tailored for applications in high efficient lasers and quantum technologies.

> **Photon:** The photon is a type of elementary particle. It is the quantum of the electromagnetic field including electromagnetic radiation such as light and radio waves, and the force carrier for the electromagnetic force. Photons are massless, [a] so they always move at the speed of light in vacuum.

> **Single-photon sources**: These are light sources that emit light as single particles or photons. They are distinct from coherent light sources (lasers) and thermal light sources such as incandescent light bulbs.

> **Elementary particle**: In particle physics, an elementary particle or fundamental particle is a subatomic particle with no substructure, i.e. it is not composed of other particles. Particles currently thought to be elementary include the fundamental fermions (quarks, leptons, antiquarks, and antileptons), which generally are "matter particles" and "antimatter particles.

> **Quantum technology**: It is a class of technology that works by using the principles of quantum mechanics (the physics of sub-atomic particles), including quantum entanglement and quantum superposition.

19 | 2nd Cancer Genome Atlas (TCGA) 2020 Conference

CONTEXT:

- The Minister of Science and Technology virtually inaugurated the 2nd TCGA 2020 conference.
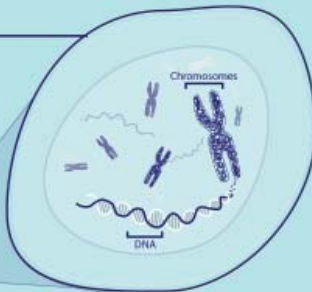
ABOUT:

- TCGA is a landmark cancer genomics program that molecularly characterized over 20,000 primary cancer and matched normal samples spanning 33 cancer types.
- This joint effort between the US- National Cancer Institute and the National Human Genome Research Institute began in 2006, bringing together researchers from diverse disciplines and multiple institutions.

What is a genome?

Human cell

Most cells in the human body have a **complete** set of genes

Your **genome** is one whole set of all your genes plus all the DNA between your genes.

There are around **20,000** genes in your **genome**

What is genomics?

Genomics is the study of the whole genome and how it works, but has also come to have a broader meaning to include the way that the genome is interpreted and the technologies that have been developed because of it.

Why?

Looking at the whole genome will help us understand how disease develops and which treatments will be most effective.

80% of rare diseases are genomic

Around **40,000** people with cancer and rare diseases will take part in the project

over **330,000** new cases of cancer reported every year and growing

We compare books (that is, other patients' genomes) and try and find letter relationships that match to better understand gene activity.

Sequencing

This means reading the human genome letter by letter (all 3 billion pairs of letters)

In the past it has taken

13 years & £2 billion to read every letter of our genetic code

Today it only takes **2 days & £1k** to read every letter

Before

Your genome with

3 Billion pairs of letters in the human genome

AAGTAATATGC
TTCTAGGCGTC
TCAAGATGCAT
CTAGCACAGC
GCCCTTTATTA
TCTCTATACTCA
ACTACTAGGGC
TATTTCATATCT
AAATACGCTCG
AGGCTACTGAC
TTATGCTATCG
ATCTCGAGCGC
TDCCGTAATTT
TCGCGAATCAG
AAGTAATATGC
TTCTAGGCGTC
TCAAGATGCAT
CTAGCACAGC
GCCCTTTATTA

5% were analysed
Only the active genes were looked at

95% were unused
All the non-gene sections that we didn't understand were disregarded as useless

Now

We know that the non-gene (non-coding) parts of your genome may have a role to play so we look at the whole thing, every single letter, and how the different parts work together.

Think of it as reading a book, **every letter counts.**

- Over the years, TCGA generated over 2.5 petabytes of genomic, epigenomic, transcriptomic, and proteomic data.

- The data, which has already led to improvements in the ability to diagnose, treat, and prevent cancer, will remain publicly available for anyone in the research community to use.

- On similar lines, the establishment of an **'Indian Cancer Genomics Atlas (ICGA)'** has been initiated by a consortium of key stakeholders in India led by CSIR, Government of India in which several government agencies, cancer hospitals, academic institutions and private sector partners.

> **Genome:**
>
> ➤ In the fields of molecular biology and genetics, a genome is all genetic material of an organism. It consists of DNA. The genome includes both the genes and the noncoding DNA, as well as mitochondrial DNA and chloroplast DNA. The study of the genome is called genomics.

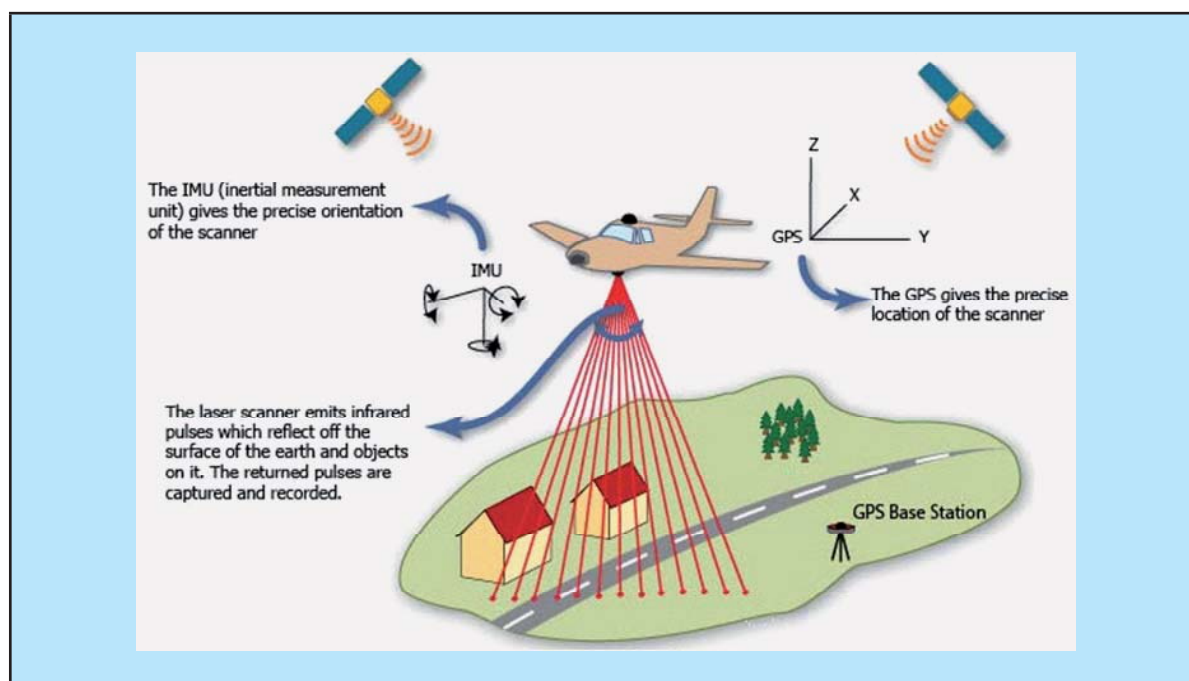## 20 LiDAR Survey Technique

CONTEXT:

- National High Speed Rail (HSR) Corporation Limited adopts Light Detection and Ranging Survey (LiDAR) technique.

ABOUT:

- The aerial LiDAR survey technique, for the first time for any railway project in India, was adopted for the Mumbai- Ahmedabad High Speed Rail Corridor primarily because of its high accuracy.

- The proposed Delhi-Varanasi HSR alignment covers mixed terrains including densely populated urban and rural areas, Highways, Roads, Ghats, Rivers, Green fieldsetc, which makes this activity more challenging.

- NHSRCL has been entrusted with the work for preparing Detailed Project Report for the Delhi-Varanasi HSR Corridor by the Ministry of Railways. The tentative length of the corridor is about 800 km, the alignment and stations will be decided in consultation with the government.

> **LiDAR:**
>
> ➤ It is a method for measuring distances (ranging) by illuminating the target with laser light and measuring the reflection with a sensor.
>
> ➤ Differences in laser return times and wavelengths can then be used to make digital 3-D representations of the target. It has terrestrial, airborne, and mobile applications.
>
> ➤ Lidar is commonly used to make high-resolution maps, with applications in surveying, geodesy, geomatics, archaeology, geography, geology, geomorphology, seismology, forestry, atmospheric physics, laser guidance, airborne laser swath mapping (ALSM), and laser altimetry.
>
> ➤ The technology is also used in control and navigation for some autonomous cars.

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21 Submarine Optical Fibre Cable Connectivity

CONTEXT:

- The Union Cabinet has given its approval for Provision of Submarine Optical Fibre Cable Connectivity between Mainland (Kochi) and Lakshadweep Islands (KLI Project).
- The Project envisages provision of a direct communication link through a dedicated submarine Optical Fibre Cable (OFC) between Kochi and 11 Islands of Lakshadweep.

Impact:

- It is evident that the growth of telecom infrastructure is closely linked with the economic and social development.
- Telecommunication connectivity plays vital role in employment generation.
- The present approval for Provision of Submarine Optical Fibre Cable Connectivity will vastly improve telecommunication facility in the Lakshadweep Islands by providing large bandwidth.
- The submarine connectivity project will have vital role for delivery of e-Governance services at the doorstep of citizens, potential development of fisheries, coconut based industries and high-value tourism, educational development in term of tele-education and in health care in terms of telemedicine facilities.
- It will help in establishment of numerous businesses, augment e-commerce activities and provide adequate support to educational institutes for knowledge sharing.
- The Lakshadweep Islands have the potential to become a hub of logistic services.

BACKGROUND:

- Union Territory of Lakshadweep comprising a number of Islands is situated in the Arabian Sea and of immense strategic significance for India.
- Provision of secure, robust, reliable and affordable Telecom facilities is of utmost importance for the people living in these islands as also from a strategic point of view for the whole country.

- Presently only medium of providing telecom connectivity to Lakshadweep is through satellites, but the bandwidth available is limited to 1 Gbps.
- Lack of bandwidth is a major constraint in providing data services, which is a pre-requisite for providing e-governance, e-education, e-banking etc. for inclusive growth of society.
- Government is accordingly committed to provide tele-communication facilities in Lakshadweep Islands Planning for laying the submarine optical fibre cable to Lakshadweep Islands has been under consideration for some time.
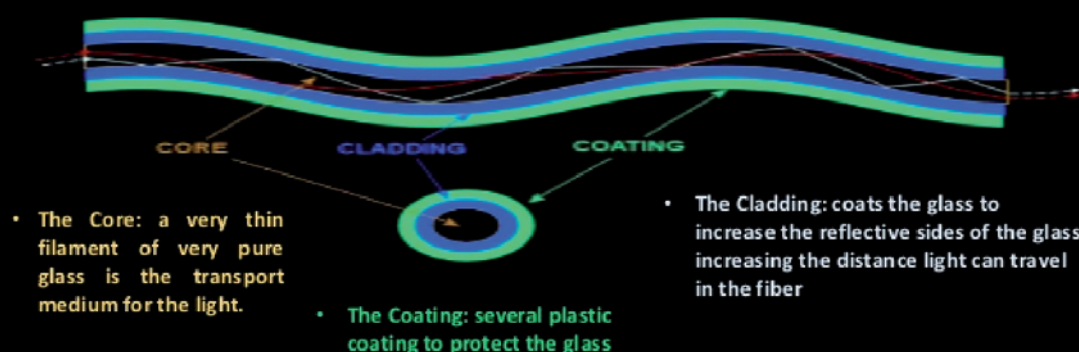
Optical fibre:

➤ It refers to the medium and the technology associated with the transmission of information as light pulses along a glass or plastic strand or fiber. Fiber optics is used long-distance and high-performance data networking.

➤ Fiber optics are also commonly used in telecommunication services such as internet, television and telephones.

➤ Fiber optic cables are used since they hold a number of advantages over copper cables, such as higher bandwidth and transmit speeds

Advantage:

➤ Support of higher bandwidth capacities.

➤ Light can travel further without needing as much of a signal boost.

➤ They are less susceptible to interference, such as electromagnetic interference.

➤ They can be submerged in water- fiber optics are used in more at-risk environments like undersea cables.

➤ Fiber optic cables are also stronger, thinner and lighter than copper wire cables

➤ They do not need to be maintained or replaced as frequently.

➤ When light traveling in an optically dense medium hits a boundary at a steep angle (larger than the critical angle for the boundary), the light is completely reflected. This is called total internal reflection. This effect is used in optical fibers to confine light in the core.

How fiber optic cables work.

A Laser injects a beam of light into the core of a glass filament. Light travels through the filament until it reaches the end of the fiber. The light will bend inside the fiber following what ever twists and turns the fiber makes.

CORE   CLADDING   COATING

- The Core: a very thin filament of very pure glass is the transport medium for the light.
- The Cladding: coats the glass to increase the reflective sides of the glass increasing the distance light can travel in the fiber
- The Coating: several plastic coating to protect the glass

22   NB-IoT (Narrow Band-Internet of Things)

CONTEXT:

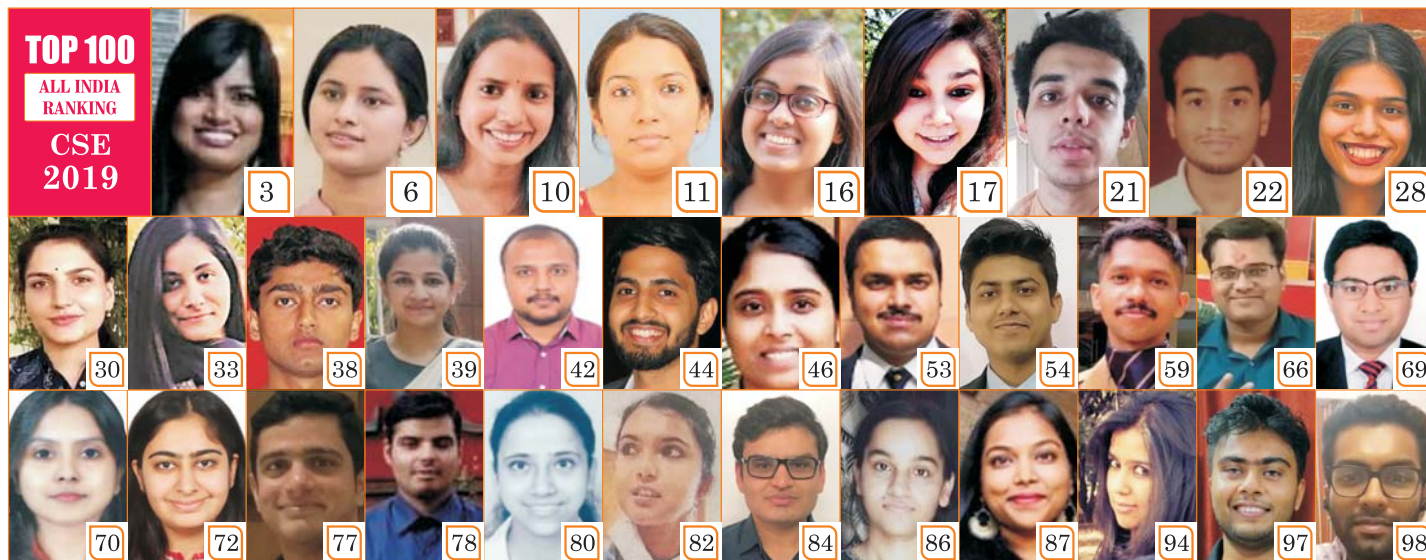- BSNL, in partnership with Skylo, to introduce worlds' first, satellite-based narrowband-IoT network in India

ABOUT:

- This new 'Made in India' Solution, which is indigenously developed by Skylo, will connect with BSNLs satellite- ground infrastructure and provide PAN-India coverage, including Indian seas.
- The coverage will be so vast that it will not leave any dark patch within the boundary of India, from Kashmir & Ladakh to Kanyakumari, and from Gujarat to the North East, including the Indian seas.
- This breakthrough announcement is very timely because it comes during the ongoing Indian Mobile Congress 2020.
- This new technology supports the Department of Telecom and NITI Aayogs plan of bringing indigenous IoT connectivity to India's core sectors.
- Examples of where this technology has already been tested successfully include, Indian Railways, fishing vessels, and enabling connected vehicles across India.
- A small, smart, incredibly rugged box, the Skylo 'User Terminal' interfaces with sensors and transmits data to the Skylo Network and into people's hands.
- The accompanying Data Platform provides an immersive, visual, experience for industry-specific applications on mobile or desktop.
- It gives users the ability to take immediate and appropriate action, no matter where they are. This new digital machine connectivity layer will serve as a complement to Smartphone-centric mobile & Wi-Fi networks, and covers India's full geography to bring online new applications for the first time.

The Internet of things

- ➤ The Internet of things describes the network of physical objects—"things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet.

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