

My Notes....

NATIONAL

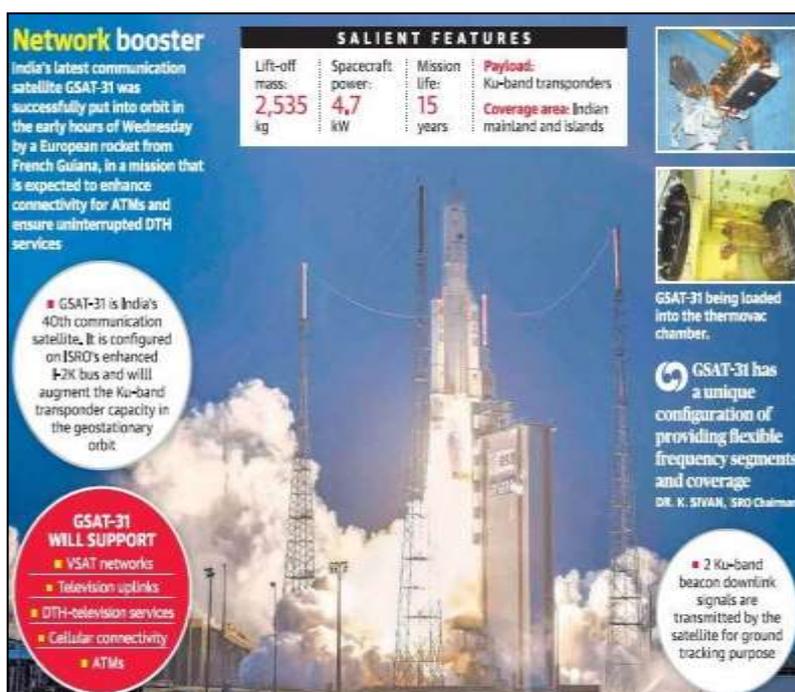
GSAT-31 LAUNCHED

Indian Space Research Organisation (Isro)'s **40th communication satellite Gsat-31** was successfully launched from the **European spaceport in French Guiana** at 2.31 am on 6 February 2019 (India time). Fourty-two minutes after the liftoff, Arianespace's Ariane-5 rocket put **Gsat-31 in its geo-transfer orbit at 3.14 am**. The 2,536 kg satellite with a **mission life of 15 years** will replace dying satellite **Insat-4CR**.

What

1. Ties with Arianespace dates back to 1981 when it's Ariane Flight L03 launched **India's APPLE experimental satellite**. Since then, our space cooperation with our European counterpart has been going stronger.

2. This is the **23rd** successful launch of an Indian satellite by an Ariane vehicle. Just last year on December 5, Arianespace launched India's heaviest satellite **Gsat-11 weighing 5,854 kg**.



Network booster
India's latest communication satellite GSAT-31 was successfully put into orbit in the early hours of Wednesday by a European rocket from French Guiana, in a mission that is expected to enhance connectivity for ATMs and ensure uninterrupted DTH services.

SALIENT FEATURES

Lift-off mass: 2,535 kg	Spacecraft power: 4,7 kW	Mission life: 15 years	Payload: Ku-band transponders Coverage area: Indian mainland and islands
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GSAT-31 is India's 40th communication satellite. It is configured on ISRO's enhanced I-2K bus and will augment the Ku-band transponder capacity in the geostationary orbit.

GSAT-31 WILL SUPPORT

- VSAT networks
- Television uplinks
- DTH-television services
- Cellular connectivity
- ATMs

GSAT-31 has a unique configuration of providing flexible frequency segments and coverage.
DR. K. SWAN, SRO Chairman

2 Ku-band beacon downlink signals are transmitted by the satellite for ground tracking purpose.

3. After separation from Ariane-5's upper stage, the two solar arrays of Gsat-31 were automatically deployed in quick succession and **Isro's Master Control Facility at Hassan** in Karnataka took over the command and control of the satellite and found its health parameters normal.
4. **Gsat-31 will replace Insat-4CR**, whose life is expected to end soon. Though Gsat-31 is not a heavy satellite (2,536kg), we are using the services of Arianespace as it is an emergency launch to replace the dying Insat satellite so that communication services are not affected.
5. **Gsat-31 satellite can only be launched with GSLV Mk III**. But our MK III rockets are already booked for Chandrayaan-2 and other important missions.
6. We don't have spare GSLV vehicle for Gsat-31." Gsat-31, which is configured on Isro's enhanced I-2K Bus, will augment the Ku-band transponder capacity in the geostationary orbit, Isro said.

7. **The satellite will provide communication services to Indian mainland and islands.** It will provide DTH television services, connectivity to VSATs for ATM, stock-exchange, digital satellite news gathering and e-governance applications.
8. The satellite will also be used for bulk data transfer for a **host of emerging telecommunication applications.** Gsat-31 will augment the Ku-band transponder capacity in geostationary orbit and provide continuity to operational services on some of the in-orbit satellites. It derives its heritage from Isro's earlier INSAT/GSAT satellite series.
9. The satellite will also provide wide-beam coverage to facilitate communication over the large oceanic region comprising large parts of the Arabian Sea, Bay of Bengal and Indian Ocean using wide-band transponder.
10. Two Ku-band beacon downlink signals are transmitted by the satellite for ground-tracking purpose. Gsat-31's Gregorian reflector antenna will boost satellite signals.

Flashback

1. **The Indian National Satellite System or Insat** is a series of multipurpose geostationary satellites that Isro had launched two decades ago to fulfil the country's requirements in the field of telecommunication, broadcasting, meteorology and search and rescue operations.
2. **Commissioned in 1983**, Insat satellite system is the largest domestic communication system in the Asia Pacific Region.
3. It is a joint venture of Department of Space, Department of Telecommunications, IMD, AIR and Doordarshan.
4. Of the **24 satellites launched in the course of the Insat programme, 11 are still in operation.**

INTERNATIONAL IP INDEX 2019

India has jumped eight places to **36th position** on the **International Intellectual Property (IP) Index**, which analyses the IP climate in **50 global economies**, this year. **India's eight-point jump in 2019** from 44th position in 2018 is the highest increase among 50 nations mapped by the index. **The US, the UK, Sweden, France and Germany remained the top five economies** on the intellectual property index in 2019 retaining their spots from the last year.

What

1. The index brought out by the US Chamber of Commerce's **Global Innovation Policy Center (GIPC)** ranks countries based on 45 indicators that are critical to an innovation-led economy supported by robust patent, trademark, copyright, and trade secrets protection.
2. The improvement **reflects important reforms implemented by Indian policy-makers** towards building and sustaining an innovation ecosystem for domestic entrepreneurs and foreign investors alike.
3. **India's overall score has also increased substantially from 30.07 per cent** (12.03 out of 40) in the previous edition to 36.04 per cent (16.22 out of 45) in the present edition.

4. For the second year in a row, India's score represents the largest gain of any country measured on the Index, which covers over 90 per cent of global gross domestic product.
5. **The US Chamber International IP Index provides an IP report card for the world** and a blueprint for policy-makers in countries like India that wish to bolster economic growth and jobs, innovation, and creativity.

Flashpoint

1. **In the first edition of the report in 2014**, which is prepared by Global Innovation Policy Center (GIPC) of the US Chambers of Commerce, **India had ranked last in the ranking of 25 countries.**
2. **In 2017, India ranked 43 out of 45 countries.** In the last two years, US Chambers of Commerce has increased its comparative study to 50 economies, contributing over 90 per cent of the global Gross Domestic Product.
3. The US tops the list of 50 global economies with 42.66 points out of 45, followed by the United Kingdom (42.22), Sweden (41.03) and Germany (41.00). China is ranked 25th with 21.45 points and **India has jumped eight position to be ranked 36 with 16.22 points.**
4. Neighbouring Pakistan is at 47th spot with 12 points and **Venezuela is at the last place with 7.11 points.**
5. Among major global economies, the report said, the "most substantial movement can be seen from India, which has surged almost 20 per cent" and climbed eight places in the IP Index rankings from 44th to 36th.

THE PERSONAL LAWS BILL 2018 PASSED

Parliament on 13 February 2019 **passed a Bill removing leprosy as a ground for divorce under five personal laws** including the **Hindu Marriage Act**. The Rajya Sabha on the last day of the Budget session passed the Bill without debate after consensus on the issue. The Upper House first passed **The Personal Laws amendment Bill 2018** by voice vote.

What

1. **The Personal Laws (Amendment) Bill, 2018** seeks to remove leprosy as a ground for divorce in five personal laws -- **Hindu Marriage Act, Dissolution of Muslim Marriages Act, Divorce Act (for Christians), Special Marriage Act** and the **Hindu Adoptions and Maintenance Act**.

Flashback

1. **Personal law is defined as a law that applies to a certain class or group of people** or a particular person, based on the **religions, faith, and culture.**
2. In India, everyone belongs to different caste, religion and have their own faith and belief.
3. Their belief is decided by the sets of laws. And these laws are made by considering different customs followed by that religion.
4. Indians are following these laws since the colonial period.

2. The Law Commission in its report had recommended repeal of laws and provisions which were discriminatory against leprosy affected people.
3. Besides, **India is a signatory to a UN Resolution** which calls for elimination of discrimination against persons suffering from leprosy.
4. In 2014, the Supreme Court had also asked the Centre and the state governments to take steps for rehabilitation and integration of leprosy affected people into the mainstream.

COMMITTEE TO EXPLORE PREPAID PAYMENTS BY DISCOMS

The government has **constituted a committee under the Central Electricity Authority (CEA) to explore prepaid payments by state electricity distribution companies** to power plants, a government official said. The government is also simultaneously looking at a recommendation made by Cabinet Secretary **P K Sinha led panel to put in place** a bill discounting mechanism ahead of elections. The latest committee, constituting chairmen of distribution companies of Tamil Nadu and Maharashtra, representatives from Union power ministry and power associations, will look into problems of delayed payments from distribution companies to power generators.

What

1. **The power ministry has already issued an advisory to states** to shift to prepaid smart metering for all consumers in the next three years.
2. In this regard, a view has emerged that the payments from discoms to generation companies may also be moved towards a prepaid system. The CEA –led committee has been asked to submit its recommendations to the power ministry in one month.
3. The committee **will study working capital cycles of power distribution companies** and generation companies and identify gaps contributing to stress in the sector.
4. It will also study the regulations with respect to payment mechanisms and transactions across power sector value chain and suggest a mechanism for the prepaid system of transactions. Power generators pay in advance to coal companies while delayed receivables from discoms mounted Rs 30,000 crore this year.
5. **Sinha-led high level empowered committee** had suggested that financial institutions like REC and **Power Finance Corp (PFC)** may discount receivables from discoms and make up front payment to generators.
6. The financial institutions providing the bill discounting facility be covered by tripartite agreement so that in case of default by discoms, Reserve Bank may recover dues from the account of states and make payment to the funding agencies.
7. The recommendations of the Sinha panel are being looked into by a group of ministers (GoM) headed by finance minister.

UNREGULATED DEPOSIT SCHEMES BILL

The Lok Sabha 13 February 2019 **passed a bill to protect gullible investors from ponzi schemes**, with Finance Minister Piyush Goyal saying the Government will ensure that

no loophole is left while framing rules. **The Banning of Unregulated Deposit Schemes Bill, 2018**, seeks to put in place a mechanism by which such depositors can be compensated. It has incorporated recommendations of the Standing Committee on Finance.

What

1. Out of the total 978 cases of unauthorised deposit schemes, **326 are from West Bengal**, which is more than one-third of the total such schemes.
2. The Government has worked quickly to put an end to such unauthorised deposit schemes and ensured that no loopholes are left by using great legal acumen while drafting the Bill.
3. The Bill was passed on the last day of Budget session-- by a voice vote after short discussion.
4. The Government expects the bill will effectively tackle the menace of illicit deposit-taking activities, and prevent such schemes from duping the poor and gullible people of their hard earned savings.
5. The bill was initially introduced in Parliament on July 18, 2018 and was referred to the Standing Committee on Finance.

What is a Ponzi Scheme?

1. A **Ponzi scheme is a fraudulent investing scam promising high rates of return** with little risk to investors.
2. The Ponzi scheme generates returns for older investors by acquiring new investors. This is similar to a **pyramid scheme** in that both are based on using new investors' funds to pay the earlier backers.
3. For both Ponzi schemes and pyramid schemes, eventually there isn't enough money to go around, and the schemes unravel.
4. The **first notorious Ponzi scheme** was orchestrated by a man named **Charles Ponzi in 1919**.

SUCCESSFUL TEST OF SFDR

Defence Research and Development Organisation (DRDO) successfully flight tested the **second indigenously developed 'Solid Fuel Ducted Ramjet (SFDR)**' propulsion based missile system from ITR, Chandipur, Odisha. Ground booster, separation of ground booster and Nozzle-less-booster performance were found satisfactory.

What

1. **Missile was guided to high altitude to simulate aircraft** release conditions and subsequently nozzle-less-booster was ignited.
2. SFDR based missile accelerated to achieve ramjet Mach number successfully. The trajectory was tracked by telemetry and radar stations till touchdown. All the mission objectives have been met.
3. The success of SFDR propulsion technology is a significant milestone and will pave the way for development of long range air-to-air missiles in the country.
4. **The ramjet propulsion system** used in the SFDR acts as an oxidizer and the solid propellant reacts as air flows through a solid propellant duct.

5. Unlike conventional rockets that carry propellant and oxidizer, **Ramjet uses the air as an oxidizer just like a jet engine**. Therefore the weight of the fuel required is eliminated.
6. The SFDR propulsion is designed in such a way that it allows for an up and down throttling. This further lets the missile to amplify its speed until it reaches the terminal phase of the flight.
7. The speed increases until the point when sharp turns are required to search for highly manoeuvring targets.
8. The first flight of SFDR, developed under a joint Indo-Russian R&D project, was tested in 2018. It had achieved the speed of Mach 3.
9. The Indian SFDR will be used as variants of missiles such as the **advanced version of ASTRA**.

SEPARATE DIVISION FOR LADAKH APPROVED

The Jammu and Kashmir government has approved carving of a **separate division for the state**. With the creation of the Ladakh division, **J&K now has three administrative and revenue divisions – Jammu, Kashmir and Ladakh**. This was a long-standing demand of the region's two districts of Leh and Kargil. The posts of Divisional Commissioner (Ladakh) and Inspector General of Police (Ladakh) have also been approved. **The new division will be headquartered in Leh.**

What

1. At present, the region is part of the Kashmir division and is administratively managed through the **Leh and Kargil Autonomous Hill Councils**.
2. In December, councillors of both Hill councils had signed resolutions demanding a separate division for Ladakh seeking "complete autonomy" from the Kashmir administrative set up.
3. The government order approving the creation of the Ladakh division states, "This decision of the Government goes a long way in fulfilling the governance and development aspirations of the people of Ladakh region."
4. The issue has been discussed at various fora and there has been a persistent demand for the creation of Division for Ladakh from many organizations including the **Ladakh Autonomous Hill Development Councils (LAHDC)** Leh and Kargil."
5. It argues that the Ladakh region is geographically isolated with a sparse population and inhospitable terrain which remains landlocked for nearly six months in a year.
6. Consequently, the Region is riddled with insurmountable problems with respect to delivery of developmental schemes, redressal of public grievances, conduct of administrative affairs and governance as such.

REGISTRATION OF MARRIAGE OF NRI BILL 2019 APPROVED

The Union Cabinet chaired by Prime Minister Narendra Modi has **approved the introduction of Registration of Marriage of Non-Resident Indian (NRI) Bill, 2019**, for creating more accountability and offering more protection against exploitation of Indian citizens, mostly women by their NRI spouses.

What

1. The Bill provides for amendment of the legal framework to act as a deterrent to the **erring NRI spouses** and creating more accountability and offer protection against exploitation of Indian Citizens married to NRIs.
2. Once the Bill is passed, marriages performed by NRIs would be registered in India or Indian Missions & Posts abroad, and necessary changes would be carried out in the:
3. **Passports Act, 1967**; and **Code of Criminal Procedure 1973 by insertion of Section 86A.**

Major Impact

1. Serving Judicial summons for Court proceedings in India is a major problem, which would be taken care of by this Bill by amending the **Code of Criminal Procedure, 1973.**
2. Thus, the Bill would offer great protection to Indian citizens married to NRIs and serve as a deterrent to NRIs against harassment of their spouses.
3. This Bill would benefit Indian women married to NRIs worldwide.

‘HELINA’ TEST-FIRED

India has test-fired **its helicopter-launched version** of one of the most-advanced **anti-tank weapons** from the Odisha coast. **Helina, the helicopter-launched version of the Nag anti-tank guided missile** with a hit range of **7-8 km**, was launched from an Army chopper. The weapon system was tested for its full range at 12.55 pm near the Integrated Test Range in Chandipur in Balasore district. During the trial, the Helina was released smoothly from the launch platform, following which the missile tracked the target all through its course in order to strike with high precision.

What

1. Developed by the **Defence Research and Development Organisation (DRDO)**, it is one of the most-advanced anti-tank weapons in the world.
2. It is guided by an **infrared imaging seeker (IIR)** operating in the lock-on-before-launch mode and helps in further strengthening the defence capabilities of the country.
3. All parameters of the flight test were monitored by the telemetry stations, tracking systems and the helicopters deployed by the Army.
4. On July 13, 2015, three round trials of Helina were conducted at a firing range in Jaisalmer in Rajasthan.
5. **Helina was also successfully test-fired from Rudra helicopter** at Pokhran test range on August 19 last year.

PM- SYM IMPLEMENTED

Pradhan Mantri Shram Yogi Maan-dhan (PM-SYM) rolled out by the Ministry of Labour and Employment on 15.02.2019. The scheme announced in the Interim Budget was notified by the Ministry recently. As many as **42 crore workers are estimated to be engaged in the unorganized sector of the country.** The unorganised workers mostly engaged as **home based workers, street vendors, mid-day meal workers, head loaders, brick kiln**

workers, cobblers, rag pickers, domestic workers, washer men, rickshaw pullers, landless labourers, own account workers, agricultural workers, construction workers, beedi workers, handloom workers, leather workers, audio- visual workers and similar other occupations whose **monthly income is Rs 15,000/ per month** or less and **belong to the entry age group of 18-40 years** are eligible for the scheme. They should not be covered under **New Pension Scheme (NPS), Employees' State Insurance Corporation (ESIC) scheme** or **Employees' Provident Fund Organisation (EPFO)**. Further, he/she should not be an income tax payer.

Salient Features of PM-SYM

1. **Minimum Assured Pension:** Each subscriber under the PM-SYM, shall receive **minimum assured pension of Rs 3000/- per month** after attaining the age of **60 years**.
2. **Family Pension:** During the receipt of pension, if the subscriber dies, the spouse of the beneficiary shall be entitled to receive 50% of the pension received by the beneficiary as family pension. Family pension is applicable only to spouse.
3. If a beneficiary has given regular contribution and died due to any cause (before age of 60 years), his/her spouse will be entitled to join and continue the scheme subsequently by payment of regular contribution or exit the scheme as per provisions of exit and withdrawal.
4. **Matching contribution by the Central Government:** PM-SYM is a voluntary and contributory pension scheme on a **50:50 basis** where prescribed age-specific contribution shall be made by the beneficiary and the matching contribution by the Central Government as per the chart. For example, if a person enters the scheme at an age of 29 years, he is required to contribute Rs 100/ - per month till the age of 60 years. An equal amount of Rs 100/- will be contributed by the Central Government.

COMMITTEE TO REVIEW SPORTS AWARDS

In a bid to create a more transparent atmosphere for awarding sports and cash awards to deserving athletes, the sports ministry **constituted a six-member committee to review the different award schemes**. The committee headed by **Justice (retd.) Indermeet Kaur Kochhar**, will mainly review the **Rajiv Gandhi Khel Ratna Award, Arjuna Awards, Dronacharya Awards, Dhyan Chand Awards, Rashtriya Khel Ratna Protsahan Puruskar** and **Maulana Abdul Kalam Azad Trophy** and special cash awards to international medal winners and their coaches.

What

1. The other members of the committee are six-time Winter Olympian and luge star Shiva Keshavan, former star athlete Ashwini Nachappa, Mohandas Pai and Rajesh Kalra, Chief Editor of Times Digital. The last member will be a Director or Deputy Secretary of the ministry.
2. The committee can change the schemes if required and can also increase and decrease the amount of the cash awards. It can also decide the number of awards being given out per year.
3. The committee will also **review the eligibility and marks criteria of the sports awards**. It can also recommend the inclusion of new international sports events which can be considered for the cash award scheme.
4. The committee has been asked to submit its report within 10 days.

DD ARUNPRABHA LAUNCHED

Prime Minister Shri Narendra Modi on 9 February 2019 launched **DD Arunprabha at Arunachal Pradesh**. He also laid foundation stone of Film and Television Institute (FTI) and several other projects in the state. Prime Minister said that in order to strengthen and develop the culture of the State, a **dedicated 24x7 Satellite TV channel DD Arunprabha** has been launched by the Government.

Background

1. **DD Arunprabha is the 24th satellite channel operated by Doordarshan.** It is equipped with state of the art facilities, including a Digital Satellite News Gathering unit to provide live coverage from remote locations, for 24x7 telecast.
2. The playout facility and the earth stations established at DDK Itanagar will ensure seamless transmission of DD Arunprabha.
3. The channel will showcase the rich tradition and diversity of local culture. Not only will it help integrate North-East with the country, but will also bring alive the magnificence of North-East by airing content sensitive to the needs and aspirations of local population including news, travelogues, mythological shows, documentaries, magazines, tele-films, reality shows, daily shows etc.
4. The permanent campus of Film and Television Institute will come up at Jollang-Rakap (Jote), Papum Pare, Arunachal Pradesh.
5. **This is the third Film and Television Institute of Ministry of I&B**, the first two being FTII Pune and SRFTI Kolkata. It is the first Film and Television Institute of entire North-East.
6. It will provide a boost to the talented youngsters of the North-East in film and television sector. The project, to be constructed at around 20 km from Itanagar, has been approved for construction at a total estimated cost of Rs. 204.32 crore.

MINORITY STATUS OF AMU REFERS TO BENCH

The Supreme Court 12 February 2019 **referred to seven-judge bench the issue of determining the correctness of minority status granted to Aligarh Muslim University.** A three-judge bench headed by Chief Justice Ranjan Gogoi referred the matter to the larger bench for defining the parameters for grant of minority status to educational institutions.

What

1. The then **UPA-led centre government had filed an appeal against the 2006 verdict of the Allahabad High**

Flashback

1. **Aligarh Muslim University Act** was enacted in the year **1920 by the imperial legislation.**
2. The Act was amended in 1951 in order to do away with the **Islamic teachings.**
3. The Act was amended in 1967 which was challenged in **Azeez Basha case.**
4. **In 2005 Allahabad High Court quashed Aligarh Muslim University Amendment Act, 1981,** was unconstitutional and that the AMU was not a minority institution and, therefore, the notification issued by the Human Resource Development Ministry in February, permitting the university to reserve seats for Muslims in post-graduate medical courses was illegal.

Court holding that the **varsity was not a minority institution**. The varsity administration had also filed a separate plea against the high court verdict on the issue.

2. The BJP government at the Centre had in 2016 told the apex court that it will withdraw the appeal filed by the erstwhile UPA government.
3. It said a five-judge Constitution bench in **1968 in the Aziz Basha case had held that AMU was a “central university”** and not a minority institution.
4. After the 1968 verdict, **the AMU (Amendment) Act, 1981 came into force**.
5. The Allahabad High Court had in January 2006 struck down the provision of the Act by which the university was accorded the minority status.

GOVERNMENT HAS RECONSTITUTED ICHR

As per Rule 3 of Rules of ICHR, New Delhi, 1972, the Government has **reconstituted the Council of Indian Council of Historical Research (ICHR)**, New Delhi for a period of **three years** w.e.f. the date of the first meeting of the re-constituted Council i.e. 07.01.2019 to 06.01.2022 and the composition of the Council is as follows:

1. An eminent historian nominated by the Government of India who shall be Chairman of the Council;
2. Eighteen historians nominated by the Government of India;
3. A Representative of the U.G.C;
4. Director-General of Archaeology;
5. Director, National Archives;
6. Four persons to represent Government who shall be nominated by the Government of India and which shall include one representative each of the Ministry of Education, the Department of Culture and the Ministry of Finance; and Member Secretary.

Flashback

1. The **Indian Council of Historical Research (ICHR) is an autonomous body** of the **Ministry of Human Resource Development**, which had been established by an Administrative Order of the then Ministry of Education.
2. The body, over many years, has provided financial assistance to the historians and direction to the research scholars in their multifarious topics of historical research through established historians and scholars of the country.
3. ICHR disburses funds for carrying out research to Indian as well as foreign scholars on their applications for fellowships, grants, and symposia, made to the Indian Council of Historical Research or through the Ministry of Human Resource Development.

AMAN-19 BEGINS

The five-day multinational maritime exercise 'AMAN-19', in which **46 nations are taking part**, commenced 8 February 2019 near the **coastal city of Karachi**. The Pakistan Navy's ships, submarines, boats, marines and Special Forces will all take part in the exercise, along with the Pakistan Air Force, Pakistan Army and Pakistan Rangers.

What

1. The principal purpose of the exercise, **conducted after every two years since it was initiated in 2007**, is to provide a forum for understanding of each other's maritime concepts and operational cultures and come up with ways and means to combat common threats at sea.
2. The flag of 46 countries including Pakistan were hoisted and the contingents of Pakistan Navy presented a march-past.
3. Commander Pakistan Fleet, Vice Admiral Amjad Khan Niazi, who was the chief guest of the opening ceremony, said the exercise AMAN, which means peace, is a step to enhance cooperation, take benefit from mutual advantage and understand each other.
4. He said maritime security is pivotal for national security and protection of maritime routes is also necessary for the economy.
5. Ambassadors and delegates of various countries were also present in the inauguration ceremony.

INTERNATIONAL

RUSSIA SUSPENDS INF NUCLEAR DEAL

Russia has suspended the Cold War-era Intermediate-range Nuclear Forces Treaty after a similar move by the United States, President Vladimir Putin said on 2 February 2019, also instructing the government not to initiate disarmament talks with Washington. **Moscow's relations with the West have been at their lowest over a number of issues**, including **Russia's annexation of Crimea from Ukraine** as well as allegations of it meddling with the presidential election in the U.S. and being behind a nerve agent attack in Britain.

What

1. **The row over the INF treaty** is yet another twist in **Russia's worsening relations** with the United States and the West on the whole.
2. The American partners have declared that they suspend their participation in the deal, we suspend it as well, Putin said.
3. The United States announced on 1 February 2019 **it will withdraw from the INF treaty with Russia in six months** unless Moscow ends what it says are violations of the **landmark 1987 arms control pact**.
4. Putin said Russia will start work on creating new missiles, including hypersonic ones, and told ministers not to initiate disarmament talks with Washington, accusing the U.S. of being slow to respond to such moves.

What is the INF Treaty and how did it come about?

1. **The treaty resolved a crisis of the 1980s** when the **Soviet Union deployed a missile in Europe called the SS-20**, capable of carrying three nuclear warheads. The United States responded with **cruise and Pershing II missiles** based in Europe.
2. Russia, Feb. 2, 2019. Putin said that **Russia will abandon the 1987 Intermediate-Range Nuclear Forces treaty**, following in the footsteps of the

United States, but noted that Moscow will only deploy intermediate-range nuclear missiles if Washington does so.

3. By the time President Ronald Reagan and Mikhail Gorbachev, the Soviet leader at the time, negotiated the deal to ban the weapons in 1987, the intermediate-range missiles had come to be seen as a hair trigger for nuclear war because of their short flight times — as little as 10 minutes.
4. This was particularly troubling to the Soviet command, which could be destroyed by a “bolt from the blue” strike before it could order a retaliatory attack.
5. Partly in response to this shortcoming, Moscow developed a “dead hand” trigger to fire its arsenal at the United States without an order from the leadership, based on computers interpreting radiation and seismic sensors.
6. **The treaty prohibited land-based cruise or ballistic missiles with ranges between 311 miles and 3,420 miles. It did not cover air- or sea-launched weapons, such as the US Tomahawk and Russian Kalibr cruise missiles fired from ships, submarines or airplanes, although those missiles fly similar distances.**

NATO'S 30TH MEMBER

The **North Atlantic Treaty Organisation (NATO)** said on 2 February 2019 that **Macedonia to become the alliance's 30th member**, following its historic name change. Last month's accord with **Greece to change the name of the former Yugoslav republic to 'Republic of North Macedonia'** ended one of the world's longest diplomatic disputes, paving the way for **Skopje to join NATO** and the European Union.

What

1. The **North Atlantic Treaty Organization (NATO)**, also called the **North Atlantic Alliance**, is an intergovernmental military alliance between North American countries and European countries.
2. The organization implements the **North Atlantic Treaty that was signed on 4 April 1949.**
3. NATO constitutes a system of collective defence whereby its independent member states agree to mutual defence in response to an attack by any external party.
4. NATO's Headquarters are located in Haren, Brussels, Belgium, while the headquarters of Allied Command Operations is near Mons, Belgium.

MFN STATUS TO PAKISTAN REVOKED

India on 15 February 2019 **withdrew the 'most-favoured nation' or MFN status to Pakistan** after a terror attack which took lives of at least 38 CRPF (Central Reserve Police Force) personnel in Jammu and Kashmir. **This is one of the deadliest terror attacks in Jammu and Kashmir** when a suicide bomber rammed a vehicle carrying over 100 kg of explosives into their bus in Pulwama district. The move to remove MFN status would enable India to **increase customs duty on goods** coming from the neighbouring country.

What

1. **India granted the MFN status to Pakistan way back in in 1996**, but the neighbouring country has not yet reciprocated.

2. The MFN status was accorded under WTO's General Agreement on Tariffs and Trade (GATT). Both India and Pakistan are signatories to this; and are members of the World Trade Organisation (WTO), **which means they have to treat each other and the other WTO member countries as favoured trading partners** in terms of imposing customs duties on goods.
3. Removal of this status means **India can now enhance customs duties to any level on goods coming from Pakistan.**
4. Last year in November, a senior aide to Pakistan's Prime Minister Imran Khan had said that the country has "no immediate plans" to grant MFN status to India.
5. Pakistan allows **only 137 products** to be exported from India through the Wagah border land route.
6. Total India-Pakistan trade has increased marginally to \$2.41 billion in 2017-18 as against \$2.27 billion in 2016-17. India imported goods worth \$488.5 million in 2017-18 and exported goods worth \$1.92 billion in that fiscal.
7. Under MFN pact, a **WTO member country is obliged to treat the other trading nation in a non-discriminatory manner**, especially with regard to customs duty and other levies.

Pros of MFN

1. **MFN status is helpful for the developing nations.** The countries with the status have broader access to a market for trade goods, reduced cost of export items owing to highly reduced tariffs and trade barriers.
2. It also reduces the bureaucratic hurdles and varied kinds of other tariffs for imports. It then increases demands for the goods and giving a boost to the economy and export sector.

What India imports and exports

1. India mainly exports **cotton, dyes, chemicals, vegetables and iron and steel**; while it **imports fruits, cement, leather and spices.**
2. The CCS meet was chaired by Prime Minister Narendra Modi to discuss the security scenario in J&K in the wake of the Pulwama terror attack.

IPC TO LIFT RUSSIA BAN

The **International Paralympic Committee (IPC)** said on 8 February 2019 it would lift the ban on Russia's Paralympic Committee by March 15, under certain conditions.

Russia has been barred from international Paralympic competitions **since August 2016 over allegations of state-sponsored doping** similar to the ones that led to the suspension of its athletics federation and anti-doping agency. The IPC said the **Russian Paralympic Committee (RPC)** had met 69 of the 70 reinstatement criteria outlined in 2016.

What

1. **In August 2016 the IPC suspended the RPC** because it was necessary and proportionate to the situation we faced and essential to ensure clean sport.
2. Twenty-nine months later it is the IPC Governing Board's firm belief that keeping the RPC suspended is no longer necessary and proportionate to the situation we now face in Russia.

3. **A two-part WADA-commissioned report** by Canadian lawyer Richard McLaren in 2016 found evidence of state-sponsored doping scheme across several sports and at 2014 Winter Olympics in the Russian city of Sochi.
4. The report led to the ban against the Russian Paralympic Committee and saw dozens of Russians banned from competing at the 2016 Rio Olympics.
5. The IPC said that it will publish post-reinstatement criteria for the RPC that set out requirements for it to keep its conditional reinstatement.
6. The requirements will include Russian anti-doping agency RUSADA remaining compliant with World Anti-Doping Agency (WADA) regulations.
7. RUSADA, which was also suspended in the wake of the scandal, was reinstated last year, angering sports bodies around the world. In January, WADA decided not to suspend RUSADA despite Moscow missing a deadline to hand over laboratory data.
8. Russia's athletics federation remains suspended over evidence of systematic and state-sponsored doping.

Flashback

1. The **International Paralympic Committee (IPC)** is the global governing body of the Paralympic Movement.
2. **Its purpose is to organise the summer and winter Paralympic Games** and act as the International Federation for **ten sports**, supervising and coordinating World Championships and other competitions.
3. The vision of the IPC, run by 200 members, is 'To enable Paralympic athletes to achieve sporting excellence and inspire and excite the world.'
4. **Founded on 22 September 1989 as a non-profit organisation**, it is based in Bonn, Germany and aims to develop sports opportunities for all people with an impairment from the beginner to elite level.

INDIA AND INDONESIA ON COOPERATION OF OUTER SPACE

The Union Cabinet chaired by Prime Minister Narendra Modi has **given ex-post facto approval to the Framework Agreement between India and Indonesia** on cooperation in the exploration and uses of outer space for peaceful purposes. The Framework Agreement was signed and exchanged Jakarta on May 30, 2018.

Point-wise details

1. This Framework Agreement shall enable the following potential interest areas of cooperation such as, **space science, exploration of outer space, use of space technology**, remote sensing of the earth; operation and maintenance of the integrated BIAK TTC station, hosting of Indian ground station, hosting of IRIMS station, in kind support for launching LAPAN made satellites,, cross utilisation of ground stations etc.
2. This Framework Agreement **would lead to concluding Implementing Arrangements for specific activities**. This would also lead to setting up a Joint Working Group, drawing members from DOS/ISRO, and Indonesian National Institute of Aeronautics and Space (LAPAN), for the purpose of achieving the goals of this agreement.

3. **The signing of the Framework Agreement will strengthen the cooperation between India and Indonesia.** This agreement will help in establishing ISRO's TTC station and IRIMS station at Indonesia

Background

1. **India and Indonesia pursue space cooperation for more than two decades** and Indian Space Research Organisation (ISRO) has established ground stations at Biak, Indonesia to provide Telemetry Tracking and Command (TTC) support for ISRO's launch vehicle and satellite missions.
2. This cooperation currently pursued under agency level (**ISRO- Indonesian National Institute of Aeronautics and Space -LAPAN) MoUs signed in 1997 and 2002.**
3. As per the 1997 MoU, the title of the equipment was to be handed over to LAPAN after 05 years, retaining the right of operation, maintenance, and utilisation.
4. Considering the above, enhancing the cooperation to government level, ISRO and LAPAN have negotiated a draft Framework Agreement between India and Indonesia on cooperation in the exploration and uses of outer space for peaceful purposes and arrived at mutually agreed version during the meeting between India and Indonesia held at Jakarta during April 23-26, 2018.
5. On obtaining necessary approvals of Ministry of External Affairs (MEA) and Prime Minister as Minister-in-Charge, this Framework Agreement was signed and exchanged during the visit of Hon'ble Prime Minister of India to Indonesia on May 30, 2018.

MISSILE DEFENCE SYSTEMS FOR AIR INDIA ONE

The **US has agreed to sell two state-of-the-art missile defence systems to Air India One** for an estimated cost of \$190 million, a move that **will enhance the security of planes flying the prime minister and the president.** According to the Pentagon, the sale will support the foreign policy and national security of the US by helping to strengthen the **US-Indian strategic relationship.** The Trump administrations approved purchase of the two systems known as **Large Aircraft Infrared Countermeasures (LAIRCAM)** and **Self-Protection Suites (SPS)** for an estimated cost of \$190 million.

What

1. The US decision came after the Indian Government recently made request for **LAIRCAM SPS**, given the high-level threat to the prime minister and the president.

Flashback

1. The **US is the second-largest arms supplier to India.** It has already recognised India as a "major defence partner", a status that which commits the US to facilitate technology sharing with India.
2. In 2018, **the US granted India Strategic Trade Authorisation-1 (STA-1) status.** India is the **only South Asian country to get STA1 status** and third Asian country after Japan and South Korea.
3. The status eases defence procurement from US. Last year both New Delhi and Washington signed **COMCASA** (Communications Compatibility and Security Agreement).

2. The defence systems, which would bring security of Air India One at par with that of Air Force One, **would be installed in two Boeing 777 Head-of- State aircraft.**
3. The Indian Government plans to buy two **Bowing 777 from the national carrier Air India for this specific purpose** and unlike in the past would not be used for commercial purposes.
4. The purpose of the **LAIRCM programme is to protect large aircraft from man-portable missiles.** Once installed, the LAIRCAM system increases crew-warning time, decreases false alarm rates and automatically counters advanced intermediate range missile systems, according to the Federation of American Scientists.
5. The missile warning subsystem will use multiple sensors to provide full spatial coverage.
6. The counter-measures subsystem will use lasers mounted in pointer-tracker turret assemblies. It also automatically counters advanced intermediate range missile systems with no action required by the crew.

ISLAMIC REVOLUTION ANNIVERSARY

Iranians are pouring out onto the streets of Tehran and other cities and towns across the country, marking the date **40 years ago that's considered victory day in the country's 1979 Islamic Revolution.** On **Feb. 11 that year**, Iran's military stood down after days of street battles, allowing the revolutionaries to sweep across the country while the government of **Shah Mohammad Reza Pahlavi** resigned. Crowds were marching on 11 February 2019, heading out from a dozen points in the Iranian capital toward Tehran Azadi, or Freedom Square.

What

1. Tehran's downtown Enghelab, or Revolution Street, is decorated with huge balloons. Loudspeakers are blaring out revolutionary and nationalist songs to encourage people to join the rallies.
2. This year's anniversary come as tensions are rising with the U.S. and Iran is grappling with re-imposed U.S. sanctions.
3. The **Iranian Revolution was a series of events** involving the overthrow of the monarch of Iran, **Mohammad Reza Shah Pahlavi** and replacing his government with an Islamic republic under the Grand Ayatollah Ruhollah Khomeini, a leader of one of the factions in the revolt.
4. The movement against the United States-backed monarchy was supported by various leftist and Islamist organizations and student movements.

INDIA-NORWAY MARINE POLLUTION INITIATIVE

The Ministry of Environment, Forests and Climate Change signed a letter of Intent establishing the **India-Norway Marine Pollution Initiative** together with the Norwegian ministry of Foreign Affairs. In January, 2019, **the Indian and Norwegian governments agreed to work more closely on oceans by signing a MoU** and establishing the India-Norway Ocean Dialogue during the Norwegian Prime Minister's visit to India in January.

What

1. **A joint Task Force on Blue Economy** with government officials, researchers and experts as well as private sector was established to develop sustainable solutions within strategic areas of the blue economy, such as maritime and marine sector in addition to energy sector.
2. In partnership, **Norway and India will share experiences and competence**, and collaborate on efforts to develop clean and healthy oceans, sustainable use of ocean resources and growth in the blue economy.
3. Both the governments launched the first Joint initiative under this new partnership. The India-Norway Marine Pollution Initiative will combat marine pollution, which is one of the fastest growing environmental concerns.
4. The Joint Initiative was signed formally by Mr. Nils Ragnar Kamsvåg, Ambassador to India, Embassy of Norway and Mr. Anil Kumar Jain, Additional Secretary, Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India.
5. Through a range of implementing partners, this initiative will seek to support local governments in implementing sustainable waste management practices, develop systems for collecting and analyzing information about sources and scope of marine pollution and improve private sector investment.
6. Support will also be directed towards beach clean-up efforts, awareness raising campaigns and pilot project using plastic waste as fuel substitution for coal in cement production and developing frameworks for deposit schemes.

Flashback

1. **Blue economy** is a term in economics relating to the exploitation and preservation of the **marine environment**. Its scope of interpretation varies among organizations.
2. According to the **World Bank**, the blue economy is the "**sustainable use of ocean resources for economic growth**, improved livelihoods, and jobs while preserving the health of ocean ecosystem."
3. European Commission defines it as "**All economic activities related to oceans, seas and coasts**. It covers a wide range of interlinked established and emerging sectors."
4. The **Commonwealth of Nations** considers it "**an emerging concept which encourages better stewardship of our ocean or 'blue' resources.**"

ECONOMY

INTERIM BUDGET 2019-20

The **key highlights of the Interim Budget 2019-20** presented by the Union Minister for Finance, Corporate Affairs, Railways & Coal, Shri Piyush Goyal in Parliament on 1 February 2019 are as follows:

New Announcements

Farmers

1. 12 crore small and marginal farmers to be provided with **assured yearly income of Rs. 6000 per annum under PM-KISAN**

2. Outlay of Rs. 75,000 crore for FY 2019-20 with additional Rs. 20,000 crore in RE 2018-19
3. Outlay for **Rashtriya Gokul mission** increased to Rs 750 crore
4. **Rashtriya Kamdhenu Ayog to be setup** for sustainable genetic up-gradation of the Cow resources
5. **New separate Department of Fisheries for welfare** of 1.5 crore fishermen
6. 2% interest subvention to Farmers for Animal husbandry and Fisheries activities; additional 3% in case of timely repayment.
7. Interest subvention of 2% during disaster will now be provided for the entire period of reschedulement of loan

Labour

1. **Pradhan Mantri Shram Yogi Maandhan scheme** to ensure fixed monthly pension to 10 crore unorganized sector workers
2. Rs 3000 per month after 60 years of age with an affordable contribution of only Rs 100/55 per month

Health

1. **22nd AIIMS to be setup in Haryana**

MGNREGA

1. Rs. 60, 000 crore allocation for MGNREGA in BE 2019-20

Direct Tax proposals

1. **Income upto Rs. 5 lakh exempted from Income Tax**
2. More than Rs. 23,000 crore tax relief to 3 crore middle class taxpayers
3. Standard Deduction to be raised to Rs. 50,000 from Rs. 40,000
4. TDS threshold to be raised from Rs. 10,000 to Rs. 40,000 on interest earned on bank/post office deposits
5. **Existing rates of income tax to continue**
6. Tax exempted on notional rent on a second self-occupied house
7. TDS threshold for deduction of tax on rent to be increased from Rs. 1,80,000 to Rs. 2,40,000
8. Benefit of rollover of capital gains increased from investment in one residential house to two residential houses for capital gains up to Rs. 2 crore.
9. Tax benefits for affordable housing extended till 31st March, 2020 under Section 80-IBA of Income Tax Act
10. Tax exemption period on notional rent, on unsold inventories, **extended from one year to two years**

Fiscal Programme

1. Fiscal deficit pegged at 3.4% of GDP for 2019-20
2. **Target of 3% of fiscal deficit to be achieved** by 2020-21.
3. Fiscal deficit brought down to 3.4% in 2018-19 RE from almost 6% seven years ago
4. Total expenditure increased by over 13% to Rs.27,84,200 crore in 2019-20 BE

5. Capital Expenditure for 2019-20 BE estimated at Rs. 3,36,292 crore
6. Centrally Sponsored Schemes (CSS) allocation increased to Rs. 3,27,679 crore in BE 2019-20
7. **National Education Mission allocation increased by about 20%** to Rs. 38,572 crore in BE 2019-20
8. Allocation for Integrated Child Development Scheme (ICDS) increased by over 18% to Rs. 27,584 crore in BE 2019-20
9. Substantial increase in allocation for the Scheduled Castes and Scheduled Tribes -
10. Allocation for SCs increased by 35.6% - from Rs. 56,619 crore in BE 2018-19 to Rs. 76,801 crore in BE for 2019-20
11. Allocation for the STs increased by 28% - from 39,135 crore in BE 2018-19 to Rs. 50,086 crore in 2019-20 BE
12. Government confident of achieving the disinvestment target of 80,000 crore
13. Focus now on debt consolidation along with fiscal deficit consolidation programme

Poor and Backward Classes

1. **25% additional seats in educational institutions** to meet the 10% reservation for the poor
2. Targeted expenditure to bridge urban-rural divide & to improve quality of life in villages
3. All willing households to be provided electricity connections by March 2019

North East

1. Allocation to be increased by 21% to Rs. 58,166 crore in 2019-20 BE over 2018-19 BE
2. **Arunachal Pradesh came on the air map recently**
3. Meghalaya, Tripura and Mizoram came on India's rail map for the first time
4. Container cargo movement through improved navigation capacity of the Brahmaputra

Vulnerable sections

1. **A new committee under NITI Aayog** to identify all the remaining De-notified nomadic and semi-Nomadic tribes.
2. New Welfare development Board under Ministry of social justice and empowerment for development and welfare of De-notified nomadic and semi nomadic tribes

Defence

1. **Defence budget to cross Rs 3,00,000 crore for the first time ever**

Railways

1. Capital support of Rs.64,587 crore proposed in 2019-20 (BE) from the budget
2. Overall capital expenditure programme to be of Rs. 1,58,658 crore
3. Operating Ratio expected to improve from 98.4% in 2017-18

Entertainment Industry

1. Indian filmmakers to get access to Single window clearance as well for ease of shooting films
2. Regulatory provisions to rely more on self-declaration
3. **To introduce anti-camcording provisions in the Cinematograph Act to control piracy**

MSME and Traders

1. **2% interest subvention on an incremental loan of Rs 1 crore for GST** registered SMEs
2. Atleast 3% of the 25% sourcing for the Government undertakings will be from women owned SMEs
3. Renewed Focus on Internal trade ; DIPP renamed to Department for Promotion of Industries and Internal trade

Digital Villages

1. The Government to make 1 lakh villages into Digital Villages over next five years

Other Announcement(s)

1. **New National Artificial Intelligence portal** to support National Program on Artificial Intelligence

Key message in the Interim Budget 2019-20

1. Moving towards realizing a 'New India' by 2022 -
2. Clean and healthy India with universal access to toilets, water and electricity to all
3. An India where Farmers' income would have doubled
4. Ample opportunities to youth and women to fulfil their dreams
5. An India free from terrorism, communalism, casteism, corruption and nepotism

Vision for the next Decade

1. Foundation for India's growth and development laid in the past 5 years
2. Poised to become a **Five Trillion Dollar Economy** in the next five years
3. **Aspire to become a Ten Trillion Dollar Economy in the next 8 years** thereafter

Ten dimensions of Vision for India of 2030

1. To build physical as well as social infrastructure and to **provide ease of living**
2. To create a Digital India, digitize government processes with leaders from youth
3. Making India pollution free by leading transport revolution with Electric Vehicles and **focus on Renewables**
4. Expanding rural industrialisation using modern digital technologies to generate massive employment
5. Clean Rivers, safe drinking water to all Indians and efficient use of water through micro-irrigation
6. Besides scaling up of Sagarmala, Coastline and Ocean waters powering India's development and growth

7. Aim at our space programme – Gaganyaan, India becoming the launch-pad of satellites for the World and placing an Indian astronaut into space by 2022
8. Making India self-sufficient in food, exporting to the world to meet their food needs and producing food in the most organic way
9. A healthy India via Ayushman Bharat with women having equal rights and concern for their safety and empowerment
10. Transforming India into a Minimum Government Maximum Governance nation with pro-active and responsible bureaucracy

UNIFIED REGULATOR FOR IFSCS

The Cabinet has approved the setting up of a unified authority that would regulate all the financial services in **International Financial Services Centres (IFSC)**, such as the Gujarat International Finance Tec-City (GIFT) in Gandhinagar. This is to be done through the International Financial Services Centres Authority Bill, 2019. **An IFSC is aimed at encouraging Indian companies** that are conducting business in foreign financial centres such as London and Singapore, to bring that business to India by providing them with a global-standard regulatory and business environment.

What

1. **IFSC would also complement and promote further development of financial markets in India.** Currently, the banking, capital markets and insurance sectors in IFSCs are regulated by multiple regulators, i.e. RBI, SEBI and IRDAI.
2. The dynamic nature of business in the IFSCs necessitates a high degree of inter-regulatory coordination. It also requires regular clarifications and frequent amendments in the existing regulations governing financial activities in IFSCs.
3. Since the development of financial services and products in IFSCs would require focussed and dedicated regulatory interventions, the government decided that a unified financial regulator for IFSCs in India would ease the process and help in easing doing business in India.
4. The Authority shall regulate all such financial services, financial products and FIs in an IFSC which has already been permitted by the Financial Sector Regulators for IFSCs, the government said.
5. **The Authority shall also regulate such other financial products**, financial services or FIs as may be notified by the Central Government from time to time.
6. It may also recommend to the Central Government such other financial products, financial services and financial institutions which may be permitted in the IFSCs.
7. The Bill also seeks to empower the proposed authority with “all powers exercisable by the respective financial sector regulatory” in the specific case of IFSCs and pertaining to the regulation of their financial products, financial services and FIs.

PRADHAN MANTRI KISAN SAMMAN NIDHI

To provide an assured income support to the small and marginal farmers, the Government is launching the **Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)** in Interim Budget 2019-20 on 1 February 2019.

What

1. Under this programme, **vulnerable landholding farmer families, having cultivable land upto 2 hectares**, will be provided **direct income support at the rate of Rs. 6,000 per year**.
2. This income support will be transferred **directly into the bank accounts of beneficiary farmers**, in **three equal instalments of Rs. 2,000 each**.
3. **This programme will be funded by Government of India**. Around 12 crore small and marginal farmer families are expected to benefit from this.
4. The programme would be made effective from **1st December 2018** and the first installment for the period upto 31st March 2019 would be paid during this year itself.
5. PM-KISAN would not only provide assured supplemental income to the most vulnerable farmer families, but would also meet their emergent needs especially before the harvest season. PM-KISAN would pave the way for the farmers to earn and live a respectable living.

SCIENCE AND TECHNOLOGY

NEW METHOD FOR FERTILITY OF OIL-SOAKED SOIL

Researchers from Rice University in the US fine-tuned their **method to remove petroleum contaminants from soil** through the age-old process of **pyrolysis**. The technique, described in the journal Environmental Science and Technology, **gently heats soil while keeping oxygen out**, which avoids the damage usually done to fertile soil when burning hydrocarbons cause temperature spikes.

What

1. While large-volume marine spills get most of the attention, **98 per cent of oil spills occur on land**, with more than 25,000 spills a year reported to the **Environmental Protection Agency**.
2. Seeing downtrend in oil prices as state & central governments have reduced taxes says Dharmendra Pradhan, Petroleum & Natural Gas Minister.
3. The researchers put soil samples from Texas, contaminated in the lab with heavy crude, into a kiln to see what temperature best eliminated the most oil, and how long it took.

Flashback

1. **Pyrolysis is the thermal decomposition of materials** at elevated temperatures in an inert atmosphere.
2. It involves the **change of chemical composition and is irreversible**. The **word is coined from the Greek-derived elements pyro "fire" and lysis "separating"**.
3. Pyrolysis is most commonly used to the treatment of organic materials. It is one of the processes involved in charring wood.
4. In general, pyrolysis of organic substances produces volatile products and leaves a solid residue enriched in carbon, char. Extreme pyrolysis, which leaves mostly carbon as the residue, is called **carbonization**.

4. Their results showed **heating samples in the rotating drum at 420 degree Celsius for 15 minutes eliminated 99.9 per cent of total petroleum hydrocarbons (TPH)** and 94.5 per cent of **polycyclic aromatic hydrocarbons (PAH)**, leaving the treated soils with roughly the same pollutant levels found in natural, uncontaminated soil.
5. It follows several papers by the same group that detailed the mechanism by which **pyrolysis** removes contaminants and turns some of the unwanted hydrocarbons into char, while leaving behind soil almost as fertile as the original.
6. Heating it to 470 degree Celsius did a marginally better job in removing contaminants, but used more energy and, more importantly, decreased the soil's fertility to the degree that it could not be reused.
7. The true test of the pilot programme came when the researchers grew Simpson black-seeded lettuce, a variety for which petroleum is highly toxic, on the original clean soil, some contaminated soil and **several pyrolysed soils**.

SACHIN SAGA VR

JetSynthesys, a digital entertainment and gaming company, on 4 February 2019 launched **India's first Multiplayer Virtual Reality Cricket Game– Sachin Saga**. Sachin Tendulkar himself unveiled the game's headset and the VR game at the ongoing **CII India Gaming Show (IGS)**, which is a three-day international gaming, animation and infotainment show take place in New Delhi.

What

1. **Sachin Saga VR** will give cricket lovers an on-ground stadium immersion right from the middle of the pitch. Players can test their batting reflexes and face bowlers, who will bowl at over 150 kmph. Real-time tracking allows the cricket ball to be tracked from pitch to wicketkeeper in the game.
2. The company is also promising high-end graphics, real-time shadows and motion captured by Sachin Tendulkar himself, which are available in 28 unique cricketing shots.
3. Gamers will also get access to over 100 cricket matches in the Legend mode and take on international opponents in quick matches across real-world stadiums in the **virtual reality game**. They will also be able to compete in head-to-head multiplayer matches with friends and family.
4. The headset supports a 100-degree view of the field, resin lenses and a customized Bluetooth controller for pro-gaming action.
5. **With VR, for the first time**, the lines between gaming and real blur to give gamers an accurately simulated experience of the stadium, with real-time action right on their mobile screens.

Flashback

1. **Augmented reality (AR)** adds **digital elements to a live view often by using the camera on a smartphone**. Examples of augmented reality experiences include Snapchat lenses and the game Pokemon Go.
2. **Virtual reality (VR) implies a complete immersion experience that shuts out the physical world**. Using VR devices such as HTC Vive, Oculus Rift or Google Cardboard, users can be transported into a number of real-world and imagined

environments such as the middle of a squawking penguin colony or even the back of a dragon.

3. In a **mixed reality (MR) experience, which combines elements of both AR and VR**, real-world and digital objects interact. Mixed reality technology is just now starting to take off with Microsoft's HoloLens one of the most notable early mixed reality apparatuses.

UNIQUE SHAPE OF ULTIMA THULE UNVEILS

NASA's New Horizons spacecraft has beamed back new images of **Ultima Thule**, which show that the most distant world ever explored is much flatter than previously thought. The images of the KBO — officially named **2014 MU69** — were captured by the New Horizons as it raced away at **over 50,000 kilometers per hour on January 1**.

The images were taken nearly 10 minutes after New Horizons crossed its closest approach point.

What

1. NASA's New Horizons mission sent home close-up images of Ultima Thule, a 20-mile-long space rock in the uncharted heart of the **Kuiper Belt**. Chris Dignam has more.
2. The newly released images also contain important scientific information about the shape of **Ultima Thule**, which is turning out to be one of the major discoveries from the flyby.
3. At left is a composite of two images taken by New Horizons' high-resolution **Long-Range Reconnaissance Imager (LORRI)**, which provides the best indication of Ultima Thule's size and shape so far.
4. Preliminary measurements of this Kuiper Belt object suggest it is approximately 20 miles long by 10 miles wide (32 kilometers by 16 kilometers).
5. An artist's impression at right illustrates one possible appearance of Ultima Thule, based on the actual image at left. The direction of Ultima's spin axis is indicated by the arrows. (Image source: NASA/JHUAPL/SwRI; Sketch: James Tuttle Keane)
6. The first close-up images of Ultima Thule — with its two distinct and, apparently, spherical segments — had observers calling it a "snowman."
7. However, more analysis of approach images and these new departure images have changed that view, in part by revealing an outline of the portion of the KBO that

Flashback

1. **Ultima Thule is a trans-Neptunian object** located in the **Kuiper belt**. It is a contact binary 31 km (19 mi) long, composed of two joined bodies 19 km (12 mi) and 14 km (9 mi) across that are nicknamed "Ultima" and "Thule", respectively.
2. With an orbital period of 298 years and a low inclination and eccentricity, it is classified as a classical Kuiper belt object.
3. With the New Horizons space probe's flyby at 05:33 on 1 January 2019 (UTC time), 2014 MU69 became the farthest and most primitive object in the Solar System visited by a spacecraft, both bodies being planetesimal aggregates of much smaller building blocks.

was not illuminated by the Sun, but could be “traced out” as it blocked the view to background stars.

8. **Stringing 14 of these images into a short departure movie**, New Horizons scientists can confirm that the two sections (or “lobes”) of Ultima Thule are not spherical.
9. The larger lobe, nicknamed “Ultima,” more closely resembles a giant pancake and the smaller lobe, nicknamed “Thule,” is shaped like a dented walnut.

RESEARCHERS CLOSE TO TACKLING THE HIV VIRUS

An international team of researchers is **harnessing the immune system to reveal new clues that may help in efforts to produce an HIV vaccine.**

SFU professor Mark Brockman and co-authors from the University of KwaZulu-Natal in South Africa have identified a connection between infection control and **how well antiviral T cells respond to diverse HIV sequences.** According to Brockman, HIV adapts to the human immune system by altering its sequences to evade helpful **antiviral T cells.**

Flashback

1. **HIV stands for Human Immunodeficiency Virus and is different to AIDS**, which is the advanced stage of HIV infection.
2. The HIV virus can be spread through infected blood, breast milk, semen, and anal or vaginal fluids contaminating the blood stream.
3. The HIV virus attacks the immune system by using the **body’s defence cells to replicate**, while simultaneously destroying the same cells that protect the body from illness.
4. If HIV is not treated with antiretroviral treatment - which works by preventing the virus from replicating - then the body is exposed to opportunistic infections which can cause serious illnesses.

What

1. Brockman’s team has developed **new laboratory-based methods for identifying antiviral T cells** and assessing their ability to recognise diverse HIV sequences.
2. Since HIV is highly diverse and evolves constantly during untreated infection, **the peptide antigen sequence** also changes.
3. Matching T cells against the HLA variants and HIV peptide antigens expressed in an individual is a critical step in the routine research process.
4. The study demonstrates that individual T cells differ widely in their ability to recognize peptide variants and suggests that these differences may be clinically significant in the context of a diverse or rapidly evolving pathogen such as HIV.

GRAPHENE BIOSENSOR

Scientists have developed a **graphene-based biosensor** that **could ‘sniff’ out evidence of lung cancer from a person’s breath**, paving the way for low-cost, early diagnosis systems. Researchers from University of Exeter in the UK developed a **new technique that could create a highly sensitive graphene biosensor** with the capability to detect molecules of the most common lung cancer biomarkers.

What

1. **The new biosensor design could revolutionise existing e-nose devices**, that identify specific components of a specific vapour mixture — for example a person's breath — and analyses its chemical make-up to identify the cause.
2. The device, described in the journal *Nanoscale*, displays the potential to identify specific lung cancer markers at the earliest possible stage.
3. It will be both cost-effective and highly beneficial for health service providers worldwide, researchers said.
4. The new biosensors which we have developed **show that graphene has significant potential for use as an electrode in e-nose devices**, said Ben Hogan, a postgraduate researcher from the University of Exeter.
5. For the first time, we have shown that with suitable patterning graphene can be used as a specific, selective and sensitive detector for biomarkers, Hogan said.
6. The quest to discover viable new techniques to accurately detect early-stage lung cancer is one of the greatest global health care challenges.
7. Although it is one of the most common and aggressive cancers, killing around 1.4 million people worldwide each year, the lack of clinical symptoms in its early stages means many patients are not diagnosed until the latter stage, which makes it difficult to cure.
8. **Due to the unrestrainable nature of the abnormal cancer cells**, while they begin in one or both lungs, they are prone to spread to other parts of the body rapidly.
9. There are currently no cheap, simple, or widely available screening methods for early diagnosis of lung cancer.
10. Using multi-layered graphene, the team suggest that current e-nose devices — which combine electronic sensors with mechanisms for pattern recognition, such as a neural network — could revolutionise breath diagnostic techniques.
11. Using patterned multi-layered graphene electrodes, the team were able to show greater sensing capabilities for three of the most common lung-cancer biomarkers — **ethanol, isopropanol and acetone** — across a range of different concentrations.
12. The team believes this could be the first step towards creating new, improved and cheaper e-nose devices that could give the earliest possible lung-cancer diagnosis.

Flashback

1. **Graphene is an allotrope (form) of carbon** consisting of a **single layer of carbon atoms arranged in a hexagonal lattice**.
2. It is a semimetal with small overlap between the valence and the conduction bands (zero bandgap material).
3. It is the basic structural element of many other allotropes of carbon, such as **graphite, charcoal, carbon nanotubes and fullerenes**.

EXOPLANETS REVEAL HOW WORLDS ARE FORMED

Scientists have analysed two recently **discovered exoplanets that have similar sizes but very different densities**, and may offer a unique insight into how worlds are

KSG – (DELHI VN) 9717380832, (DELHI RN) 9811293743, (JAIPUR) 8290800441, (BHOPAL) 7509975361, (PATNA) 7463950774, (INDORE) 9893772941, www.ksgindia.com

formed. **Kepler-107b** and **Kepler-107c** have **almost identical radii of 1.5 and 1.6 Earth radii**, but their densities that are over twice as different, researchers said. Scientists from **Italy's National Institute for Astrophysics (INAF)** and University of Bristol in the UK spent three years observing the exoplanetary system **Kepler-107 via the Telescopio Nazionale Galileo in La Palma**.

What

1. They gathered more than a hundred spectroscopic measurements of all four **sub-Neptune mass planets in Kepler-107** — named after the **NASA Kepler space** telescope that discovered the exoplanetary system five years ago.
2. Unlike Earth's relation to the Sun, the planets in the Kelper-107 system are much closer to each other and their host star (their equivalent of our sun).
3. All of the planets have an orbital period of days as opposed to years. It is not uncommon for the planet that is closest to the host star to be the densest due to heating and interaction with the host star which can cause atmosphere loss.
4. However, in the case of Kepler-107, **the second planet, 107c**, is denser than the first, 107b, according to a study published in the journal Nature Astronomy.
5. So much so that 107c contains in its core an iron mass fraction at least twice as large as that of 107b, indicating that at some point, 107c had a head-on high-speed giant collision with a protoplanet of the same mass or more collisions with multiple planets of a lower mass.
6. These impacts would have ripped off part of the rock and silicate mantle of Kepler-107c, suggesting that it is denser now than it was originally.

THE MAGNETIC NORTH POLE IS ON THE MOVE

Earth's north magnetic pole has been drifting so fast in the last few decades that scientists say that past estimates are no longer accurate enough for precise navigation. The **magnetic north pole is wandering about 34 miles (55 kilometres) a year**. It crossed the International Date Line in 2017, and is leaving the Canadian Arctic on its way to Siberia.

What

1. **The constant shift is a problem for compasses in smartphones** and some consumer electronics. Airplanes and boats also rely on magnetic north, usually as backup navigation, said University of Colorado geophysicist Arnaud Chulliat, lead author of the newly issued **World Magnetic Model. GPS isn't affected because it's satellite-based**.
2. The military depends on where magnetic north is for navigation and parachute drops, while NASA, the Federal Aviation Administration and US Forest Service also use it.
3. Airport runway names are based on their direction toward magnetic north and their names change when the poles moved. For example, the airport in Fairbanks, Alaska, renamed a runway 1L-19R to 2L-20R in 2009.
4. The US National Oceanic and Atmospheric Administration and United Kingdom tend to update the location of the magnetic north pole every five years in December, but this update came early because of the pole's faster movement.
5. Since 1831 when it was first measured in the Canadian Arctic it has moved **about 1,400 miles (2300 kilometres) toward Siberia**. Its speed jumped from about 9

miles per year (15 kilometres per year) to 34 miles per year (55 kilometres per year) since 2000.

6. **The reason is turbulence in Earth's liquid outer core.** There is a hot liquid ocean of iron and nickel in the planet's core where the motion generates an electric field.
7. In general Earth's magnetic field is getting weaker, leading scientists to say that it will eventually flip, where north and south pole changes polarity, like a bar magnet flipping over. It has happened numerous times in Earth's past, but not in the last 780,000 years.
8. A flip coming sooner rather than later because of the weakened magnetic field and an area over the South Atlantic has already reversed beneath Earth's surface.
9. That could bother some birds that use magnetic fields to navigate. And an overall weakening of the magnetic field isn't good for people and especially satellites and astronauts. The magnetic field shields Earth from some dangerous radiation.

MARCO CUBESATS GO SILENT

NASA has lost touch with the first mini-spacecraft that ventured into deep space, according to the US space agency which said that it is unlikely **the twin CubeSats** will be heard from again. The **MarCO CubeSats were launched last year to test if such low-cost technology can operate in deep space.** The twins, **nicknamed EVE and WALL-E** after characters from a Pixar film, served as communications relays during the InSight's Mars landing, beaming back data at each stage of its descent to the Martian surface in near-real time, along with InSight's first image.

What

1. **WALL-E sent back stunning images of Mars as well**, while EVE performed some simple radio science. Having travelled well past Mars, the twin CubeSats seem to have reached their limit, NASA said in a statement.
2. It has been over a month since engineers have heard from MarCO, which followed NASA's InSight to the Red Planet. At this time, the mission team considers it unlikely they will be heard from again.
3. The experimental technology cost a fraction of what most space missions do — USD 18.5 million. **WALL-E was last heard from on December 29 and EVE, on January 4.**
4. Based on trajectory calculations, WALL-E is currently more than 1.6 million kilometers past Mars; EVE is farther, almost 3.2 million kilometres past Mars. The mission team has several theories for why they have not been able to contact the pair. WALL-E has a leaky thruster.
5. **Attitude-control issues could be causing them to wobble** and lose the ability to send and receive commands. The brightness sensors that allow the CubeSats to stay pointed at the Sun and recharge their batteries could be another factor.
6. **The MarCOs are in orbit around the Sun** and will only get farther away as February wears on. The farther they are, the more precisely they need to point their antennas to communicate with Earth.
7. The MarCOs will not start moving toward the Sun again until this summer. The team will reattempt to contact the CubeSats at that time, though whether their

batteries and other parts will last that long can not be predicted. Even if they are never revived, the team considers MarCO a spectacular success.

MISCELLANEOUS

FIRST WOMAN TO PLAY 200 ODIS

India captain Mithali Raj on 1 February 2019 became the **first woman cricketer to play 200 ODIs**, adding another achievement to her illustrious career. The **36-year-old** is also the **highest run-getter in ODIs with 6622 runs** at an average of 51.33, including seven hundreds.

What

1. **She had hit an unbeaten 63 in the second ODI**, helping India take an unassailable 2-0 lead in the series.
2. Mithali made her ODI debut way back in 1999 and has featured in 200 games out of the 263 ODIs India have played.
3. She has also played 10 Tests and 85 T20s.
4. **Mithali made her ODI debut against England in Milton Keynes in January 1999** and on 1 February 2019 became the first woman to complete 200 matches in the 50-over format. Not to forget, she is the top run-getter in the world with 6,622 runs.

GOVT BANS SIMI

The **Centre banned the Students Islamic Movement of India (SIMI)** for a **period of five more years starting February 1** under the **Unlawful (Activities) Prevention Act**. It said the organisation was indulging in activities “**prejudicial to the security of the country**” and disturbing peace and communal harmony.

What

1. In its notification, **the Home Ministry listed 58 cases against members of SIMI**. Some of the cases include the blasts in Gaya in 2017, M Chinnaswamy stadium in Bangalore in 2014, and jailbreak in Bhopal in 2014.
2. The Home Ministry’s proposal to ban the organisation after 15 states and Union Territories sought the same.
3. The police from Madhya Pradesh, Maharashtra, Delhi, Tamil Nadu, Telangana and Kerala submitted to the government details of convictions against top SIMI leaders including Safdar Nagori and Abu Faisal.
4. **SIMI was established on April 25, 1977, in Aligarh in Uttar Pradesh**. The organisation allegedly works on the agenda of liberating India by converting it into an Islamic state. **It was first declared an outlawed outfit in 2001**. Since then, it has been banned on several occasions.
5. SIMI was last banned on February 1, 2014, by the UPA government for a period of five years. The new notification, issued on January 31, 2019, will be effective for a period of five years till January 2024.

LEH TRANSMISSION LINE

The Prime Minister, Shri Narendra Modi dedicated the **220 kV Srinagar- Alusteng - Drass- Kargil – Leh Transmission System to the Nation**, a step that would ensure quality power supply to Ladakh round the year. This would give huge boost to the tourism sector and enhance **socio-economic development of Ladakh**. The Prime Minister had laid the **foundation stone for this project on 12 August, 2014** and within 4.5 years, the project has been completed by the **Power Grid Corporation of India Limited (POWERGRID)**, a Navratna Company of Government of India, under Ministry of Power.

About Srinagar- Alusteng - Drass- Kargil – Leh Transmission Line

1. Built at a **height of around 3000-4000 meters**, this approx. 335 km long transmission line has been constructed by POWERGRID.
2. In this project, **the four new State-of-the-Art 220/66 kV Gas Insulated Sub-stations** built at Drass, Kargil, Khaltsi and Leh will help to ensure 24x7 quality power in all weather conditions.
3. Funding provisions have been in the ratio of 95:05 (95% Govt. of India share and 5% J&K state share).

Benefits to the region

1. The implementation of this project was also **aimed to supply power to the people of Ladakh** in harsh winters and evacuation of surplus power of Kargil & Leh Hydel stations of NHPC in summers.

2. It is a flagship project of Government of India, under PMRP scheme which was aimed to improve reliability & quality of power supply in Ladakh region of J&K by connecting with National Grid.

3. This will not only help evacuate power in summers, but will also supply power to the region in winters when

temperatures dip and hydro electricity generation do not match up. The project will meet the power demand of Ladakh region at economical rates.

4. With quality electricity available at reasonable rates, hospitality industry in Ladakh will get a boost, as their reliance on diesel sets will reduce. This will also attract tourists looking for affordable stay in all weathers.

About POWERGRID

1. The **Power Grid Corporation of India Limited (POWERGRID)** is an Indian state-owned electric utilities company **headquartered in Gurugram, India**.
2. **POWERGRID transmits about 50% of the total power generated in India** on its transmission network.
3. Its former subsidiary company, **Power System Operation Corporation Limited (POSOCO)** handles power management for National Grid and all state transmission utilities.
4. **POWERGRID also operates a telecom business under the name POWERTEL.**
5. POWERGRID is one of the World's Largest Power Transmission Utility, and has a wide network of 150,874 circuit kilometers transmission lines, with 238 Sub-stations and transformation capacity of 351,106 MVA.

CUTLASS EXPRESS 2019

INS Trikand, a front-line warship of the Indian Navy, participated in a **multinational training exercise 'CUTLASS EXPRESS – 19'** held from 27 Jan to 06 Feb 19. The aim of the

exercise was **to improve law enforcement capacity, promote regional security and progress inter-operability** between the armed forces of the participating nations for the purpose of interdicting illegal maritime activity in the **Western Indian Ocean**. During the exercise, Naval, Coast Guard and Marine Police personnel from a number of East African countries were jointly trained by mentors from **USA, India, and Netherlands**, with support of international organisations like the **International Maritime Organisation (IMO)**, **Combined Maritime Force (CMF)** and **European Naval Forces (EUNAVFOR)**.

What

1. **The Indian Navy played a significant role in 'CUTLASS EXPRESS - 19'**, being involved in planning, coordination and execution.
2. Through INS Trikand, the IN provided a platform for live **Visit Board Search Seizure (VBSS)** drills, which proved to be of immense training value to the participating nations.
3. The exercise was conducted in **two phases**. The first, called the **Command Post Exercise (CPX)** was conducted from 27 Jan to 02 Feb 19. It involved training of personnel on shore for coordination and conduct of VBSS operations.
4. During the CPX, extensive training and interaction was carried out between the officers and sailors of the Indian Navy and personnel from the participating nations.
5. The training included exposure of the personnel to the various software tools used by the **US Navy and the European Union** for integration of maritime information, with a view to positively identify a suspicious vessel and direct a VBSS operation against it.
6. The second phase called the **Final Training Exercise (FTX)** was conducted from 03 - 05 Feb 19. This phase consisted of actual boarding operations at sea and live boardings were out onboard INS Trikand, anchored off **Djibouti harbour**. The closing ceremony of the event was held at the Djibouti Naval Base on the morning of 06 Feb 19.
7. The ship's stay at Djibouti harbour also enabled the crew to interact professionally with the crew of other ships in harbour, including the Japanese Maritime Self Defense Force Ship Samidare, Spanish Naval ship ESPS Relampago and United States Ship Chung Hoon.
8. Mutual ship visits were organised with a view to promote inter-operability between the Indian Navy and the other navies, as also understanding of best practices.
9. Officers from the ship's Operations team also visited Camp Lemonnaire, the American base at Djibouti. During this visit, the Commanding Officer called on Major General James D Craig, US Army, Commander Joint Task Force – **Horn of Africa**.
10. The IN officers also visited the Japanese military base at Djibouti, where they were briefed about the JMSDF operations towards anti-piracy in the region.
11. INS Trikand, commanded by Captain Srinivas Maddula, is equipped with a versatile range of sensors and weapons enabling her to address threats in all the three dimensions – air, surface and sub-surface.
12. The ship's extended endurance at sea makes it an ideal platform for prolonged deployments, including the present one, in which she is carrying out Presence

and Surveillance missions and Anti-piracy operations in the Gulf of Aden and Western Arabian Sea.

13. The ship is a part of the Indian Navy's Western Fleet and operates under the Flag Officer Commanding-in-Chief, Western Naval Command, headquartered at Mumbai.

SMART CITY RANKING 2019

Nagpur bagged the first rank out of 100 smart cities across India, securing 360.21 marks, followed by Bhopal with 329.32 marks in the Smart City ranking 2019. Last year, **Surat had emerged as India's No. 1 smart city** with the largest number of projects implemented and completed under the Smart City Mission.

What

1. The ranks are based on the proportion of total smart city projects under progress and completed for a city. The more the proportion of total cost of project under progress and completed, the higher is the rank.
2. **The Centre had launched the Smart Cities Mission on June 25, 2015.** The objective was to promote sustainable and inclusive cities.
3. Some of the core infrastructure elements in a smart city include **adequate water supply, assured electricity supply, sanitation**, including solid waste management, **efficient urban mobility and public transport, affordable housing**, especially for the poor, **robust IT connectivity and digitisation and good governance**.

ABU DHABI INCLUDES HINDI AS COURT LANGUAGE

Abu Dhabi has included Hindi as the third official language used in its courts, alongside **Arabic and English**, as part of a move designed to improve access to justice. The Abu Dhabi Judicial Department said **it has extended the adoption of interactive forms of statement** of claims filed before courts by including the Hindi language alongside Arabic and English in labour cases.

What

1. **This is aimed at helping Hindi speakers to learn about litigation procedures**, their rights and duties without a language barrier, in addition to facilitating registration procedures via unified forms.
2. According to official figures, the UAE population is estimated to be around nine million of which **2/3rd are immigrants from foreign countries**. The Indian community in the UAE, numbering 2.6 million, constitutes 30 % of the total population and is the largest expatriate community in the country.
3. The adoption of new languages comes as part of the bilingual litigation system, the first phase of which was launched in November 2018, through the adoption of procedures requiring the plaintiffs to translate the case documents in civil and commercial lawsuits into English, if the defendant is a foreigner.
4. The foreign investor receives the case files translated, thus contributing to the provision of a global judicial service that meets the requirements of residents in the Emirate of Abu Dhabi.

IAF GETS CHINOOK

In a shot in the arm for the Indian Air Force, **the first four of the 15 Chinook heavy-lift helicopters arrived in India** from the **US** on 10 February 2019. **The first four CH-47F Chinooks** for the IAF were brought to the **Mundra Port in Gujarat**. They will be assembled in Gujarat before being ferried to Chandigarh, where they will be formally inducted into the IAF later this year. At Chandigarh, **the helicopters will become a part of the 126 Helicopter Flight**, which currently operates the last of the Mi-26 heavy lift helicopters.

What

1. The helicopters have come before their scheduled arrival in March. The ahead-of-schedule arrival of the Chinooks validates Boeing's commitment to delivering on its promise of modernizing India's defense forces.
2. Through its current partnerships with Indian Air Force and Indian Navy, Boeing has ensured high rate of mission readiness and increased operational capabilities.
3. In 2015, India had cleared the purchase of **22 Apaches and 15 Chinook helicopters for the IAF** in a deal worth \$2.5 billion from the US. The defence ministry had also finalised its order with Boeing for the production, training and support of the helicopters.
4. IAF crews had begun their training on the Chinooks at Delaware in the US last year. Earlier this month, the first Chinook helicopter was handed over to the IAF in Philadelphia.
5. **The CH-47F Chinook** is said to be an advanced multi-mission helicopter operated by the US Army and 18 other defence forces. Boeing added that the Chinook "will provide the Indian armed forces with unmatched strategic airlift capability across the full spectrum of combat and humanitarian missions."
6. The Chinook, which is a battle proven machine, can carry 9.6 tons of load, including artillery guns, light armoured vehicles and heavy machinery to high altitude areas. It is well suited for mountainous operations, due to its high maneuverability and ability to easily move in and out of valleys.
7. For India, the helicopters would add to the existing capabilities of the IAF. They will be of immense importance when needed to quickly ferry the M777 Ultra Light Howitzers to mountainous regions.
8. **India is procuring 145 M777s for the army** for deployment along the borders opposite China and Pakistan. The helicopters could also come in use of the construction agencies in the North East to lift heavy equipment for strategic roads construction.

HAROP ATTACK DRONES APPROVED

In a major boost for Indian Air Force's unmanned warfare capability, the Defence Ministry has **approved 54 Israeli HAROP attack drones** which can crash into high-value enemy military targets to destroy them completely. **The Air Force already has an inventory of around 110 of these drones** which have now been renamed as **P-4**. These are equipped with **electro-optical sensors to loiter** over high-value military targets such as surveillance bases and radar stations before exploding them.

What

1. The project is likely **to strengthen the capability of the Air Force** which is going to showcase the capabilities of the missile during the forthcoming Exercise **Vayu Shakti** where the loitering UAV would be shown destroying a simulated enemy radar target.
2. **India is also discussing the Project Cheetah** with the Israelis under which almost all the drones of the three services would be turned into high-quality attack drones and their surveillance capabilities would also be enhanced.
3. The three forces have a fleet of more than 100 of these unmanned aerial vehicles which have been acquired over the years in different batches.
4. The forces are also working on developing indigenous combat drones which would be deployed on both the China and Pakistan border once the project is complete.
5. Americans have been using the combat drones to carry out targeted assassinations of terrorist leaders in Afghanistan, Iraq and Pakistan but the relatively slow unmanned vehicles are not known to be very effective in warfare where the opposition also has a strong air force.

Flashback

1. An **unmanned aerial vehicle (UAV)**, commonly known as a drone, is an aircraft without a human pilot aboard.
2. **UAVs are a component of an unmanned aircraft system (UAS)**; which include a UAV, a ground-based controller, and a system of communications between the two.
3. The flight of UAVs may operate with various degrees of autonomy: either under remote control by a human operator or autonomously by onboard computers.

ADIEU TO ROVER OPPORTUNITY

Opportunity, a remarkably durable NASA rover designed to roll along the surface of Mars for three months, **has stopped communicating with Earth after 15 years of service**, officials said, ending a mission that astounded the U.S. space agency. **Engineers lost contact with the solar-powered vehicle on June 10** during a dust storm that encircled Mars. Since then, NASA officials made numerous attempts to reach the six-wheeled rover, which is **about the size of a golf cart**.

What

1. **Opportunity's equipment may have been compromised by the storm**, which struck while the rover was at a site called Perseverance Valley and blotted out sunlight needed by the robot's solar panels, officials said.
2. **The vehicle was built to drive six-tenths of a mile (1 km)**, but ended up covering 28 miles (45 km) and lasting longer on Mars than any other robot sent to the surface of the Red Planet.
3. Engineers sent a transmission in a last attempt to revive the rover, but heard nothing back, said Thomas Zurbuchen, associate administrator for NASA's Science Mission Directorate.

4. As **Opportunity explored craters on Mars**, it gathered evidence to demonstrate the planet in the ancient past was wet and warm enough to possibly sustain life. That included the discovery of white veins of the mineral gypsum, an indication of water moving through underground fractures.
5. Opportunity landed on Mars **in January 2004**, a few weeks after its rover twin, Spirit.
6. Spirit ended its mission in 2010 after becoming stuck in soft soil.
7. The Opportunity mission cost more than \$1 billion, with about 300 JPL staff members dedicated to the project soon after it landed, John Callas, project manager for Mars Exploration Rovers, said by phone.
8. The team had dwindled to 30 by the time Opportunity went silent, he said. Its members are going to other projects.
9. Another NASA rover called **Curiosity, which arrived on Mars in 2012**, continues its work on the Martian surface, collecting soil samples to analyze them for signs of organic compounds.
10. NASA's InSight spacecraft, the first robotic lander designed to study the deep interior of a distant world, touched down safely on the surface of Mars in November, with instruments to detect planetary seismic rumblings never measured anywhere but Earth.
11. In Sight and the next Mars rover mission, scheduled for 2020, are both seen as precursors for eventual human exploration of Mars.