

DAILY CURRENT AFFAIRS (DCA)

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CURBING LEFTWING EXTREMISM

Context:

- Recently, the Union Home Minister informed that the government has adopted **an offensive strategy** to curb the Leftwing Extremism.

About the Leftwing Extremism (also known as Naxalism):

- It originated **in 1967** from an **uprising movement**, led by the Communist Party of India (Marxist), in the **Naxalbari area of West Bengal**.
- The followers of this movement, **often referred to as 'Naxals'**, believe in the political theory derived from the teachings of Chinese political leader Mao Zedong.
- The **LWE movement** has affected **several states in India**, including Chhattisgarh, Jharkhand, Odisha, Bihar, West Bengal, Andhra Pradesh, Telangana, Maharashtra, Madhya Pradesh, and Kerala.
 - ♦ The intensity of the problem varies across these states.

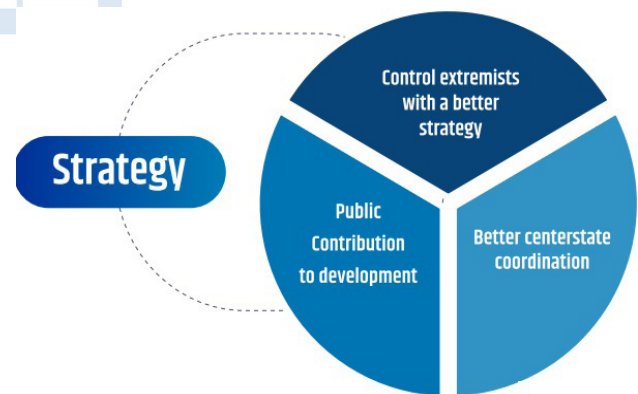
Challenges associated with the LWE in India

- **Socio-Economic Issues:** Unemployment, poverty, land disputes, displacement, distress migration, improper communication, and food insecurity are some of the socio-economic problems prevalent in the areas affected by LWE.
- **Security Threats:** LWE poses a significant security threat, leading to violence and loss of lives.
 - ♦ In 2022, for the first time in four decades, the number of deaths of civilians and security forces was under 100.
- **Hindrance to Development:** LWE groups often oppose development initiatives such as the construction of roads and installation of mobile towers, thereby hindering the overall development of the affected areas.

- **Legal and Institutional Challenges:** The government faces challenges in implementing legal and institutional measures to combat LWE.
 - ♦ For instance, the **National Investigation Agency (NIA) and the Enforcement Directorate (ED)** are working closely with state agencies to attack the financing of Left Wing Extremism.
- **Ideological Challenges:** The ideology of LWE groups, which involves the use of violence as a means to capture State power, is against the country's development and bright future.
 - ♦ This has resulted in a spiralling cycle of violence in some parts of India.

Government's Response

- **Legal and Institutional Framework:** The government has strengthened the legal and institutional framework to combat extremism by amending **The Unlawful Activities (Prevention) Amendment Act, 1967**, **National Investigation Agency Act 2008**, etc.



- **National Policy and Action Plan (2015):** It envisages a multi-pronged strategy involving security-related measures, development interventions, ensuring rights and entitlements of local communities.
- **Security Measures:** The Central Government assists the LWE affected State Governments by providing Central Armed Police Forces battalions, training,

funds for modernization of State police forces, equipment & arms, sharing of intelligence, construction of Fortified Police Stations.

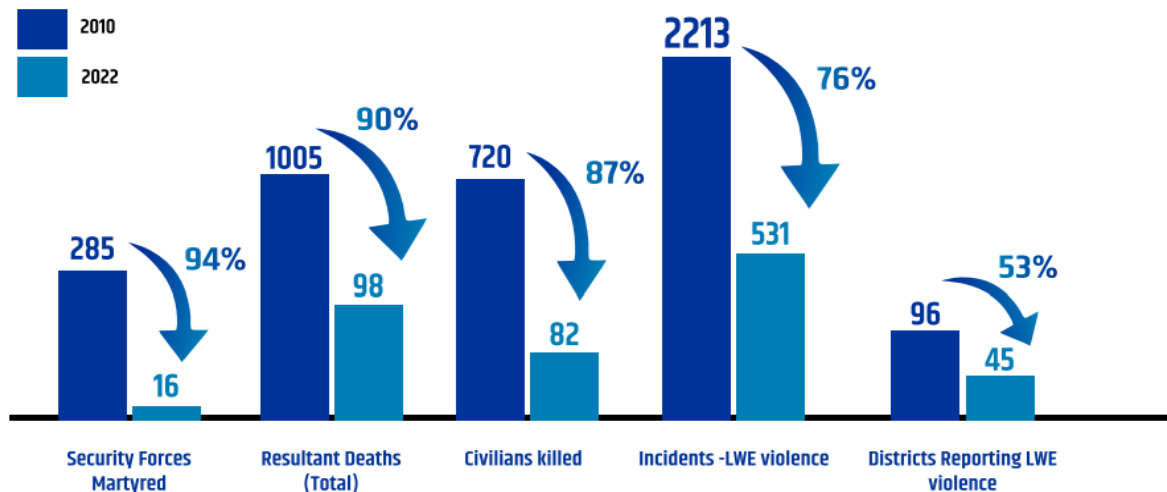
- **Development Initiatives:** Initiatives with special thrust on expansion of road network, improving telecommunication connectivity, skilling and financial inclusion.
 - ♦ **Road Network:** In the last 08 years, 9356 km of roads have been constructed at a cost of 710718 crores under two specific schemes for LWE affected areas.
 - ♦ **Connectivity:** To improve telecom connectivity, 2,343 mobile towers are installed in phase-I of the **Mobile Tower Project**, which are being upgraded to 4G.
- **Financial Inclusion:** For financial inclusion of the local populace in these areas 1,258 Bank Branches, 1,348 ATMs and 22,202 Banking Correspondents in 30 Most LWE Affected Districts and 4,903 new Post Offices in 90 districts have been made functional during the last eight years.
 - ♦ **The Security Related Expenditure (SRE) Scheme, and Special Infrastructure Scheme (SIS):** 71285 crore released to Left Wing Extremism affected states in the last 4 years under the SRE scheme.
 - Funds released under SRE increased approximately 124% during the last 9 years.
- ♦ **Assistance to Central Agencies for LWE Management Scheme (ACALWEMS):** Rs 73 crore made available for camp infrastructure and 712.06 crore for upgradation of six hospitals during the last 4 years.
- **Skill Development:** For skill development, under **Kaushal Vikas Yojana**, 43 ITIs and 38 Skill Development Centres (SDCs) have been made functional in LWE affected districts.
- **Quality Education:** For quality education in tribal blocks of LWE affected districts 245 **Eklavya Model Residential Schools** have been sanctioned in 90 LWE affected districts, of which 121 are functional.
- **Tribal Youth Exchange Program:** Under it, 22,000 youths have been taken on tour to large and developed areas of the country with an expenditure of 26.5 crores till date.
 - ♦ Its objective is to make these youths aware of technological/industrial advancement so that they can be freed from the influence of left wing extremism.
- **Intelligence Collection and Sharing:** Actionable intelligence collection and sharing mechanisms need to be strengthened³. The state police need to be modernised to be able to tackle the Naxal attacks.

The Outcome:

- According to the **data of the Ministry of Home Affairs**, LWE related violence has declined by 52% and the number of deaths by 69% from 6035 to 1868 in the decade 2014-23 compared to 2004-14.
 - ♦ Similarly, the incidents of leftist extremism have reduced from 14,862 to 7,128.
- The number of deaths of security forces due to Left Wing Extremism has declined by 72% from 1750 in 2004-14 to 485 during 2014-23 and the number of civilian deaths has declined by 68% from 4285 to 1383.
 - ♦ Similarly, the number of districts with violence was 96 in 2010, which declined by 53% to 45 in 2022.
- Along with this, the number of police stations reporting violence decreased from 465 in 2010 to 176 in 2022.

Great Downfall in Violent acts and area Limit of Left Militants in India

In the last 8 years, Three-Dimensional strategy of Home Ministry has achieved historic success in controlling left extremism. This success can be understood by these data.



Conclusion:

- While the government's efforts have resulted in a significant reduction in LWE-related violence, the problem continues to pose a challenge to India's internal security.
- Addressing this issue requires a comprehensive approach that combines security measures with socio-economic development initiatives.
- The Ministry of Home Affairs ensured people's participation in the efforts of security agencies by giving additional thrust to the schemes for the welfare of the poor and the development of militancy-affected areas.

CRIMINALISATION OF POLITICS IN INDIA

Context:

- As per the latest data available with the **Association for Democratic Reforms (ADR)**, about **one-third members** of Rajya Sabha declared criminal cases against themselves.

Criminalisation of Politics in India

- It refers to the involvement of individuals

with criminal charges or backgrounds in Indian politics. It means that persons with criminal backgrounds contest in the election and get selected as a member of parliament or state legislature.

Key Findings of ADR

- **Rajya Sabha Candidates:** About 36% of Rajya Sabha candidates have declared criminal cases against themselves while the average assets of candidates analysed stood at ₹127.81 crore.
- **Electoral Bonds:** The Supreme Court held that the **Electoral Bonds Scheme** was unconstitutional for violating the right to information of voters.
- **Registered Unrecognised Political Parties:** According to a report by ADR, the number of registered unrecognised political parties has increased two-fold from 2010 to 2019.
- **Election Commissioners Appointment:** ADR argues that the present practice of appointment of Election Commissioners by the Centre is **violative of Articles 14 and Article 324 (2)** and the **basic features of the Constitution**.

Major Reasons

- Criminalization of political parties is a result of the connection between criminals and politicians and vote-bank politics.
- Lack of enforcement of laws and judgments.
- lack of ethics, and values, and loopholes in the function of the election commission.
- It is also linked to political control of state machinery and corruption.
- The political system is unwilling to change the law or the system.

Issues of Criminalization of Politics

- **Question of safety & security:** The main purpose of governance is to provide safety and security to citizens who elect their representatives for this role.
 - ♦ But if the elected members themselves have criminal records, would they be interested in a criminal justice system that is prompt and efficient?
- **Low conviction rate:** As per the **National Crime Records Bureau's 2021 report**, only 10,416 cases of murder were disposed of during the year with just a 42.4% conviction rate.
 - ♦ The Law minister has admitted to more than 4.7 crore cases pending in various courts.
- **Situation in police stations:** Politicians play a very powerful role at police stations, compromising both integrity and impartiality of field staff.
 - ♦ In due course, ordinary criminals graduate to be dreaded ones and form gangs extorting money, grabbing land, threatening witnesses in criminal cases, etc.

Measures to Curb Criminalisation

- The **Vohra Committee** set up by the Centre in 1993 sounded a note of warning saying that “some political leaders become the leaders of these groups and, over the years, get themselves elected to local bodies, state assemblies, and the national Parliament.

- **Law Commission's 179th report:** It recommended an amendment to the Representation of People Act 1951, and suggested the people with criminal backgrounds should be disqualified for five years or until acquittal.
 - ♦ It also recommended that the person who wants to contest the election must furnish details regarding any pending case, with the copy of the FIR/ complaint, and also furnish details of all assets.

Related Supreme Court Judgement

- **In 2002:** Every candidate contesting election **had to declare his criminal and financial records** along with educational qualifications.
- **In 2005:** A sitting MP or MLA will be **disqualified** from contesting the election **if convicted and sentenced to imprisonment for two years or more** by a court of law.
- **In 2014:** The Supreme Court **accepted the Law Commission recommendations** and passed an order directing that trials against sitting MPs and MLAs should be concluded within a year of charges being framed and conducted on a day-to-day basis.
 - ♦ As a follow-up to these directives, in 2017, the government started a **scheme to establish 12 special courts** for a year to **fast-track** the trial of criminal cases against MPs and MLAs.
- **In 2021:** The **political parties** need to upload on their websites and social media platforms the **details of pending criminal cases** against their candidates and the reasons for selecting them as also for not giving tickets to those without criminal antecedents.
- **Recently**, the Supreme Court published **some necessary mandates** to avert the criminalisation of politics as many lawsuits have been withdrawn against MPs and MLAs in the past.

Association for Democratic Reforms (ADR)

- It is an **apolitical and non-partisan non-profit organisation** in India that was **established in 1999** by a group of professors from the Indian Institute of Management (IIM) Ahmedabad.
- It focuses on **corruption and criminalization** in the political process, empowerment of the electorate through greater dissemination of information relating to the candidates and the parties etc.
- It has published numerous reports on the criminal backgrounds, financial details, and other relevant information of candidates contesting in various elections.

Conclusion and Way Forward

- The criminalisation of politics in India is a grave issue that needs immediate attention. The involvement of criminals in politics not only undermines the democratic process but also hampers the development of the nation.
- There is a **need to fix the role of Political Parties** that should be more transparent and accountable in their candidate selection process.
- The **Election Commission of India and other respective authorities** need to take transparency measures about the Political Parties and their funding to the People of India so that they can **make informed decisions** while exercising their vote.
- It is high time that stringent measures are taken to curb this menace and restore faith in the democratic system.

BITCOIN HALVING

In Context

- **Crypto traders and Bitcoin miners** are preparing for the 'Bitcoin Halving'—predicted to happen in April.

What is Bitcoin?

- Bitcoin was introduced **in 2009** by an anonymous creator known as **Satoshi**

Nakamoto, is a decentralized, digital currency exchanged through a peer-to-peer network without centralized authorities.

- It's the **world's first decentralized cryptocurrency**, using **blockchain technology** to secure and verify transactions.
- The Bitcoin network is **public and open-source**, meaning anyone can participate.
- Bitcoin combines its network, cryptocurrency, and blockchain to record transactions transparently, prevent double spending, and ensure consensus via a process called "**proof-of-work**".

Indian Government's stand on Cryptocurrency

- **The Reserve Bank of India (RBI)**, has long recommended a complete ban on all crypto, warning that it has the potential to **destabilize the country's monetary and fiscal stability**.
- Despite having no regulatory framework for crypto, the Indian government had introduced a new tax regime, taxing crypto income at 30% and a 1% tax deducted at source (TDS) on crypto transactions.

What is Bitcoin Halving?

- The Bitcoin Halving refers to the **50% reduction in the reward paid to Bitcoin miners** who successfully process other people's cryptocurrency transactions so that they can be added to the public digital ledger known as the **blockchain**.
- To grow Bitcoin's blockchain and keep the ecosystem running, Bitcoin miners rely on **advanced computer equipment** to solve a complex mathematical puzzle through a process known as '**Proof of work**.'
- ♦ This intense activity is the reason Bitcoin transactions result in **huge carbon footprints and require vast amounts of electricity**.

- A halving takes place after 2,10,000 blocks are mined, and has happened so far in **2012, 2016, and 2020** - every four years.
- **Reward:** The Bitcoin miners solve the puzzle first and claim their prize, which is currently set at 6.25 Bitcoin (BTC).
 - ♦ While the reward amount is set, the true value of this prize fluctuates based on BTC prices in the market, and when the owner chooses to sell.

Impact of Bitcoin Halving:

- **Increase in Price:** Bitcoin mining increases the supply of BTC in circulation while the Bitcoin Halving reduces the rate at which these coins are released, making the asset more scarce.
 - ♦ Scarcity is seen as **pushing up prices**, as is the case with gold.
- **Demand for Cheap Electricity:** Both corporate and independent Bitcoin miners are spread across the world, trying to leverage cheap electricity prices in countries like Kazakhstan and Iran to mine as much Bitcoin as they can.

Conclusion

- **Every halving in Bitcoin's history** has been different due to factors such as increasing regulation by lawmakers worldwide, more awareness about cryptocurrency investments, greater adoption of Bitcoin, and diverse geopolitical events or economic shocks.
- While the next Bitcoin halving will be a fascinating episode to witness, it is best for crypto watchers to rely on their own research and decide what the halving means to them personally.

OPERATION AMRITH (ANTIMICROBIAL RESISTANCE INTERVENTION FOR TOTAL HEALTH)

Context

- The Kerala Drug Control Department launched Operation AMRITH to prevent the overuse of antibiotics in the state.

Background

- In 2011, the Indian government introduced the **H1 rule** to prohibit the **over-the-counter (OTC) sales** of antibiotics without a prescription, responding to the growing concern over antimicrobial resistance (AMR).
- In 2013, the rule to limit the OTC restriction was limited to second- and third-line antibiotics, allowing the sale of first-line antibiotics without a prescription.
 - ♦ Step was taken to ensure that life-saving antibiotics remained accessible to the public, especially in remote areas
- Operation AMRITH enforces the original H1 rule, mandating a doctor's prescription for acquiring any class of antibiotics.

What is Antimicrobial Resistance?

- Antimicrobial Resistance (AMR) occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections harder to treat and increasing the risk of disease spread, severe illness and death.
- Nearly **700,000 people** die of AMR every year. The toll can rise to as many as 10 million by 2050 and eat up **3.8 per cent** of annual global gross domestic product (GDP).

Causes for Antimicrobial Resistance

- **Overuse and Misuse of Antibiotics:** The excessive and inappropriate use of antibiotics in humans and animals is a major driver of antimicrobial resistance. This includes using antibiotics without a prescription, not completing the full course of prescribed antibiotics, and using antibiotics for non-bacterial infections.
- **Inadequate Dosage and Duration:** When antibiotics are not taken in the correct dosage and for the recommended duration, it can lead to incomplete eradication of the targeted microorganisms, allowing the surviving bacteria to develop resistance.

- **Self-Medication:** Self-prescription without proper medical guidance contributes to the misuse of antibiotics.
- **Antibiotics Consumption in Food-Animals:** Use of antibiotics as growth promoters in food animals and poultry is a common practice and later it evolves in the food chain.
- **Unavailability of laboratory facilities:** Over 50-70% of doctor-prescribed antibiotics are unnecessary due to lack of accurate infection diagnosis. Limited access to affordable rapid diagnostic tests contributes to this issue.
- **Global Antibiotic Research and Development Partnership (GARDP):** A joint initiative of WHO and the Drugs for Neglected Diseases Initiative (DNDi), GARDP encourages research and development through public-private partnerships.

Challenges Posed by AMR

- Antibiotic resistance is emerging as the threat to successful treatment of infectious diseases, organ transplantation, cancer chemotherapy and major surgeries.
- The issue of AMR causes out of pocket expenditure on health care, especially on medicines. The use of high order drugs or second-line expensive antibiotics pushing treatment costs high.
- **Poor Sanitation:** The large proportion of sewage is disposed of untreated into receiving water bodies, leading to gross contamination of rivers with antibiotic residues, antibiotic-resistant organisms.
- **Country wise initiatives:** A multi-sectoral \$1 billion **AMR Action Fund** was launched in **2020** to support the development of **new antibiotics**, and the U.K. is trialing a subscription-based model for paying for **new antimicrobials** towards ensuring their commercial viability.
- **Peru's efforts** on patient education to reduce unnecessary antibiotic prescriptions.
- **Australian regulatory** reforms to influence prescriber behaviour, and initiatives to increase the use of point-of-care diagnostics, such as the **EU-supported VALUE-Dx programme**.
- **Denmark's reforms** to prevent the use of antibiotics in livestock have not only led to a significant reduction in the prevalence of resistant microbes in animals, but also improved the efficiency of farming.

Global Efforts against Antimicrobial Resistance

- **Global Action Plan on Antimicrobial Resistance (GAP):** Globally, countries committed to the framework set out in the Global Action Plan (GAP) 2015 on AMR during the 2015 World Health Assembly and committed to the development and implementation of multisectoral national action plans.
- **World Antimicrobial Awareness Week (WAAW):** It is a global campaign that aims to raise awareness of antimicrobial resistance worldwide.
- **Global Antimicrobial Resistance and Use Surveillance System (GLASS):** WHO launched it **in 2015**

Measures Taken against Antimicrobial Resistance in India

- **National Action Plan on Antimicrobial Resistance (NAP-**

AMR): It has a focus on the One Health approach & was launched with the aim of involving various stakeholders ministries/ departments.

- **AMR Surveillance Network:** Indian Council of Medical Research (ICMR) established the AMR surveillance and research network (AMRSN) to generate evidence and capture trends and patterns of drug resistant infections in the country.
- **India's Red Line campaign:** Which demands that prescription-only antibiotics be marked with a red line, to discourage the over-the-counter sale of antibiotics— is a step forward.
- **FSSAI has set certain guidelines** limiting the antibiotics in food products such as fish and honey.
- **National Health Policy, 2017:** It terms antimicrobial resistance as one of the key healthcare issues and prioritizes the development of guidelines regarding antibiotic use and checks on restricting the growth of antibiotics.
- **National Antibiotic Consumption Network (NAC-NET):** The network sites compile data on antibiotic consumption in their respective health facilities and send it to National Centre for Disease Control (NCDC).

Way Ahead

- Antimicrobial resistance is a socioeconomic problem, and combating it requires measures to improve public health infrastructure, sanitation facilities, and governance.
- While enforcing the OTC regulation is a welcome step, curbing antimicrobial resistance requires a multipronged approach, including reformations to physicians' prescribing practices and mandating that hospitals report healthcare-associated infection rates.

THREE NEW SPACE INFRASTRUCTURE PROJECTS

Context

- PM Modi inaugurated three new facilities to boost the Indian Space Research Organisation's (ISRO) launch capabilities during a visit to the Vikram Sarabhai Space Centre (VSSC).

About

- The projects have been developed at a cumulative cost of about **₹1,800 crore**.
- The projects include;
 - ♦ **PSLV Integration Facility (PIF)** at the Satish Dhawan Space Centre, Sriharikota;
 - ♦ **Semi-cryogenics Integrated Engine and Stage Test facility** at ISRO Propulsion Complex at Mahendragiri; and
 - ♦ **'Trisonic Wind Tunnel'** at Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram.

PSLV Integration Facility (PIF)

- It will help in boosting the frequency of PSLV launches from **6 to 15 per year**.
- This state-of-the-art facility can also cater to the launches of **SSLV** and other small launch vehicles designed by private space companies.

Semi-cryogenics Integrated Engine and Stage Test facility

- It will enable the development of semi-cryogenic engines and stages which will increase the payload capability of the present launch vehicles.
- The facility is equipped with liquid **Oxygen and kerosene** supply systems to test engines up to **200 tons** of thrust.

'Trisonic Wind Tunnel'

- Wind tunnels are essential for aerodynamic testing for the characterisation of rockets and aircraft during flight in the atmospheric regime.

- It produces a “**controlled uniform airflow**” over scale models of rockets and aircraft to assess their aerodynamic characteristics for optimal design development.
- It has a Mach number range of **0.2 to 4**, which means it can generate speeds ranging from subsonic to supersonic up to four times the speed of sound (Mach number 4).

Astronaut for Gaganyaan mission

- PM Modi also announced the names of the four astronaut-designates that will fly to low-Earth orbit as part of ISRO’s Gaganyaan space flight mission.
- The four astronauts are Group Captain **Prashanth Balakrishnan**, Group Captain **Ajith Krishnan**, Group Captain **Angad Pratap**, and Wing Commander **Shubhanshu Shukla**.

Gaganyaan mission

- **The mission aims** to demonstrate the capability to **launch human beings** (three crew members) to **low earth orbit** and bring them back safely to earth by landing.
- **Launch vehicle:** The Launch Vehicle Mark-3 (LVM3) is the launch vehicle for the Gaganyaan mission. All systems in the LVM3 launch vehicle are reconfigured to meet human rating requirements and named Human Rated LVM3 (HLVM3).
- **Crew Escape System (CES):** HLVM3 consists of CES powered by a set of quick acting, high burn rate solid motors which ensures that Crew Module along with the crew is taken to a safe distance in case of any emergency either at launch pad or during ascent phase.
- **Orbital Module:** The Orbiter Module will orbit the Earth, and it consists of Crew Module (CM) and Service Module (SM). It is designed to keep the crew safe during ascent, orbital phase, and re-entry.

- ♦ **The Crew Module (CM)** is the habitable space with the Earth-like environment in space for the crew.
- ♦ **Service Module (SM):** It will be used to provide the necessary support to CM while in orbit. It is an unpressurized structure containing thermal system, propulsion system, power systems, avionics systems and deployment mechanisms.
- This manned mission will be the **first of ISRO’s human spaceflight missions**. The **US, Russia and China** are the only three countries to have conducted human spaceflights yet.

QUANTUM COMPUTING

Context:

- In a recent collaborative study by a group of institutions in Japan, researchers realised **qubits at room temperature in a metal-organic framework (MOF)**.

About

- A MOF is a **network of repeated molecular arrangements** where the repeating structure has a metal atom or ion with organic molecules attached to it like tentacles.
- In the system studied by the Japanese team, **zirconium is the metal component and an organic molecule containing the chromophore pentacene** bridges the metal atoms.

About Computing

- A **bit (binary digit)** is the **smallest piece of information storage** in computing. Often, a **large number of bits is required to convey meaningful information**.
- In a computer, a **bit is a physical system** with two easily discernible configurations, or states – e.g. high and low voltage.

- ♦ These physical bits are **useful to represent and process expressions** that involve 0s and 1s: for instance, low voltage can represent 0 and high voltage can represent 1.
- A **gate is a circuit that changes the states of bits** in a predictable way. The speed at which these gates work determines **how fast a computer functions**.

Quantum computing:

- Quantum computing is a revolutionary computing paradigm **utilizing the principles of quantum mechanics** to perform calculations.
- Unlike **classical computers that rely on bits (0 or 1)**, quantum computers harness qubits, which can exist in a state of superposition (both 0 and 1 simultaneously).
 - ♦ For example, to perform one calculation that requires **16 different inputs**, a classical computer requires a total of **four bits and sixteen computations**.
 - ♦ But with four qubits in superposition, a quantum computer could generate answers corresponding to all **16 inputs in a single computation**.
- This unique property allows them to **perform certain calculations exponentially faster than classical computers**, opening doors to groundbreaking advancements in various fields.

Basic requirements:

A collection of qubits is required to make a quantum device. For this, any group of qubits needs to satisfy a few basic requirements.

1. **The qubits should be identical.** The qubits can't be guaranteed to be identical since they need to be manufactured, and some 'imperfections' will creep in.
2. **It should be relatively easy to integrate** several qubits that can be operated controllably.

- ♦ Here, controllability refers to both the manipulation of individual qubits and qubit-qubit interactions.
- 3. An important, related aspect is that the **qubit system should be robust enough to function at room temperature without losing quantum features** for reasonably long durations.

Applications:

- **Drug discovery:** Simulating complex molecules to develop new drugs and materials, leading to accelerated medical innovation.
- **Financial modeling:** Optimizing financial portfolios and managing risk with unparalleled accuracy and speed.
- **Cryptography:** Breaking existing encryption methods and developing new, quantum-resistant ones.
- **Machine learning:** Revolutionizing AI by training algorithms on massive datasets much faster, leading to breakthroughs in natural language processing, computer vision, and more.
- **Materials science:** Designing novel materials with superior properties like high-temperature superconductors or efficient solar cells.

Challenges:

- **Fragility: Superposed states**, important in quantum information-processing protocols, are **fragile**.
 - ♦ The fragility arises out of the **interaction between the qubit and other systems**. The more the number of interaction channels, the faster the superposition "decoheres" and the qubit ends up in one of the two states.
- **Specific environment:** All those systems suitable for realising qubits can operate as qubits only at very low temperatures or in a high vacuum or both.

- **Commercial viability:** Quantum computers based on such technologies are expensive. If a technology is not economically viable, it is not easy to sustain it long enough for breakthroughs to happen.
- **Hardware limitations:** Qubits are fragile and prone to errors, making it difficult to build large, stable quantum computers.
- **Software development:** Quantum algorithms are fundamentally different from classical algorithms, requiring specialized programming languages and techniques.
- **Cost and accessibility:** Current quantum computers are expensive and often not accessible to the general public or even smaller research institutions.
- **Security concerns:** The power of quantum computers poses potential threats to existing encryption methods, necessitating development of quantum-resistant cryptography.

Measures:

- **Investing in research and development:** Governments and private companies are pouring resources into advancing quantum hardware and software technologies.
- **Developing error correction techniques:** Robust methods for mitigating qubit errors are crucial for building reliable quantum computers.
- **Building quantum ecosystems:** Creating platforms and tools to make quantum computing more accessible and user-friendly for developers and researchers.
- **Addressing security concerns:** Collaborating on international standards and protocols for quantum-resistant cryptography to ensure secure communication in the future.

Initiatives by the Government of India:

- **National Mission on Quantum Technologies and Applications (NM-QTA):** The Government of India announced a national mission in the Union Budget of 2020 with a proposed budget of **8000 crores** covering all areas of quantum technologies.
 - ♦ It is broadly divided into **four verticals:**
 - Quantum Computing & Simulations,
 - Quantum Communications,
 - Quantum Sensing & Metrology, and
 - Quantum Material & Devices.
- **Quantum Computing Applications Lab (QCAL):** A joint initiative by the Ministry of Electronics and Information Technology (MeitY) and Amazon Web Services (AWS), established in 2023. QCAL provides researchers and developers with access to cloud-based quantum computing resources for experimentation and application development.
- **Quantum-enabled Science and Technologies (QuEST):** Department of Science and Technology (DST) supports research projects and collaborations in quantum computing through various funding programs like QuEST.
- **I-HUB Quantum Technology Foundation (I-HUB QTF):** Department of Science and Technology (DST) also established the I-HUB QTF with participation from research institutions like IISER Pune to foster development and commercialization of quantum technologies.

Conclusion:

- Quantum computing **holds immense potential to revolutionize various industries** and solve significant challenges facing humanity.
- While we remain in the early stages of this technology, **sustained efforts to**

address the existing hurdles are paving the way for a future where quantum computers unlock unprecedented possibilities across diverse fields.

supply of ammunition from internal sources in preparedness for a long-drawn conflict.

NEWS IN SHORT

THEYYAM

In News

- Theyyams were performed at Sree Kurumba Bhagavathi temple.

About Theyyam

- It is a religious ritual practiced in northern Kerala and some parts of Karnataka.
- Theyyam, believed to have been derived from the word Daivam, meaning god
- It is based on the belief that immortal spirits enter into mortal bodies to perform a ritual dance of divine revelation.

FIRST PRIVATE AMMUNITION MANUFACTURE FACILITY OPENS

Context:

- In a **first in the private sector**, two facilities for the manufacture of ammunition and missiles were opened by **Adani Defence and Aerospace** in **Kanpur, Uttar Pradesh** recently.

About:

- The **Kanpur complex is set to become one of the largest integrated ammunition manufacturing complexes in South Asia.**
- The facilities will produce **high-quality small, medium and large calibre ammunition** for the armed forces, paramilitary forces and the police.

Need of private ammunition manufacture facility

- It will make India self-reliant in missiles and ammunition.**
- Recent geopolitical events had also re-emphasised the **need for a reliable**

DEFENCE EXPENDITURE CONCERNS IN NATO

In News

- Former U.S. President Donald Trump threatened to withdraw support to NATO citing the failure of European NATO allies to step up their defence expenditure.

About

- Direct funding of €3.8 billion as required by the 2024 budget has been fulfilled by the members to continue NATO operations and military commands, equal contribution to **indirect funding is a long-standing problem.**
- The **U.S. remains one of the major contributors** to indirect funding, with €800 billion (68%) out of the total €1,173 billion.
 - Since the formation of NATO, the U.S. has been its largest contributor.
 - In 2006, a **target of 2% of GDP** was introduced.
 - From 2006-2014, except Norway, Poland, Estonia and Albania which closely maintained their GDP share, all other member countries showed a declining trend in their shares.

About NATO

- Origin** : NATO was created by 12 countries from **Europe and North America** on 4 April 1949.
 - NATO's **founding member countries** were: Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom and the United States.
- At present, **NATO has 31 member countries.** These countries, called NATO Allies, are sovereign states that come together through NATO to discuss

political and security issues and make collective decisions by consensus.

- **Mandate** : NATO is committed to the **peaceful resolution of disputes**.
 - ♦ If diplomatic efforts fail, it has the **military power to undertake** crisis-management operations.
 - ♦ These are carried out under the collective defence clause which means that an attack against one Ally is considered as an attack against all Allies.
 - The principle of collective defence is enshrined in **Article 5 of the North Atlantic Treaty**.

GARBHINI-GA2

In Context

- **BRIC-THSTI Faridabad and IIT Madras** researchers have developed an India-specific model to determine the **age of a foetus in a pregnant woman** in the second and third trimesters precisely.

About

- Currently, the **age of a foetus (gestational age, GA)** is determined using a formula developed for **Western populations** and are likely to be erroneous when applied in the later part of pregnancy due to variations in the growth of the foetus in the Indian population.
- The **newly developed second and third-trimester GA formula, Garbhini-GA2**, accurately estimates the age of a foetus for the Indian population, reducing error by almost three times. Accurate GA is necessary for the appropriate care of pregnant women and for determining precise delivery dates.
- The model has been designed by researchers at the Indian Institute of Technology Madras and the Translational Health Science and Technology Institute, Faridabad.
- It is part of an interdisciplinary group for

advanced research on birth outcomes — the **DBT India initiative (GARBH-Ini) programme launched in 2014**, by the Department of Biotechnology.

- The **Garbhini-GA2 is the first late-trimester GA estimation model** to be developed and validated using Indian population data.
- Currently, models used for the **Western population** are in use which could prove erroneous when applied in the later part of pregnancy due to variations in the growth of the foetus in the Indian population.
- **Accurate GA** is necessary for the appropriate care of pregnant women and for determining precise delivery dates.

MISSION UTKARSH

Context:

- Recently, the **Union Ministry of AYUSH and Women & Child Development** signed an MoU for improving the **nutrition among adolescent girls**.

About the Mission Utkarsh:

- It is a **joint public health initiative** by the Ministries of Ayush and Women and Child Development.
- It is initially be **launched as a pilot project in five aspirational districts across five states - Assam (Dhubri), Chhattisgarh (Bastar), Jharkhand (Paschimi Singhbhum), Maharashtra (Gadchiroli), and Rajasthan (Dhaulpur)**
- It aims to **control anaemia** among adolescent girls **using Ayurvedic interventions**.

Implementation:

- Under this program, over 94,000 adolescent girls between the **age group of 14-18 years** registered under **Poshan Tracker** at approximately 10,000 Anganwadi Centres will be benefited in a 12-month period.

- The coordinating agency for the project will be the **Central Council for Research in Ayurvedic Sciences (CCRAS)**.

Ayurvedic Interventions:

- Ayurvedic medicines like **Drakshavaleha and Punarnavadi mandoor** will be given to improve the health of these anaemic adolescent girls for three months.
- These Ayurvedic interventions, backed by evidence from institutions like the Indian Council of Medical Research (ICMR), will offer a cost-effective solution to tackle anaemia.

GOVERNMENT SECURITY (G-SEC)

Context

- The Finance Ministry said that the government will not borrow through Treasury Bills as it has completed G-Sec borrowing for the current fiscal.

What is Government Security (G-Sec)?

- It is a **tradable instrument** issued by the Central Government or the State Governments.
- Such securities are **short term** (usually called treasury bills, with original maturities of less than one year) or **long term** (usually called Government bonds or dated securities with an original maturity of one year or more).
- In India, the Central Government issues both treasury bills and bonds or dated securities while the State Governments issue only bonds or dated securities, which are called the State Development Loans (SDLs).
- G-Secs carry practically no risk of default and, hence, are called risk-free gilt-edged instruments.

Treasury Bills (T-bills)

- T-bills, which are money market instruments, are short term debt

instruments issued by the Government of India.

- They are **zero coupon securities** and pay no interest. Instead, they are issued at a discount and redeemed at the face value at maturity.
 - ♦ The difference between discount price and face value is earning for the investors.
- Presently they are issued in three tenors, namely, **91 day, 182 day and 364 day**.

BALEEN WHALES

Context:

- Recently, the Scientists discovered the anatomy behind the songs of **Baleen Whales** that use a **larynx, or voice box**, anatomically modified to enable underwater vocalisation.

About Baleen Whales (Mysticetes):



- They are marine mammals and some of the largest creatures on the Earth. They are known for their haunting songs.
- They include species such as the **blue whale, humpback, right whales, bowhead whales**, and others.
- They are known for **their unique feeding mechanism** involving **baleen plates**, a large rack of fine, hair-like keratin used to filter out small krill from the water.
- Different species of baleen whales differ in the shape of the baleen and the fineness of the fringe.
 - ♦ It reflects **different feeding styles and food types**:

- Short baleen plates with a coarse fringe describes a fish-eating whale;
- Long plates with a fine, silky fringe allow others to hunt smaller animals such as zooplankton.

Conservation Status:

- **Red List** of Threatened Species of IUCN:

- ♦ **Critically Endangered:** North Atlantic Right Whale
- ♦ **Endangered:** Blue Whale; North Pacific Right Whale
- ♦ **Least Concern:** Humpback Whale; Bowhead Whale
- Threats to these majestic creatures include ship strikes, entanglement in fishing gear, habitat degradation, and noise pollution.

