FWD

FORTUNE WEEKLY DIGEST

› Arighaat Nuclear Submarine › Unified Pension Scheme › Biotechnology

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FORTUNE WEEKLY DIGEST

EDITOR'S NOTE

As UPSC aspirants, it is essential to stay updated on current affairs to excel in the examination. This **Fortune Weekly Digest (ForWarD)** brings you the latest news and developments from around the world, carefully curated and analyzed to help you prepare for the Civil Services (Main) Examination.

We understand that time is precious, and we have made sure to present the information in a concise and easy-to-understand manner.

The magazine is divided into different sections. Mains relevant topics have been covered in detail with a UPSC previous year question perspective. The jot downs are examples and interesting facts to enrich your answer writing. Cherrypicks has some key words from the week, helpful again in answer writing and essay. We have also included essay topics and sample questions to help you guage your preparation.

We have designed this magazine to best supplement the daily current affairs notes we have launched by the name of **FIND (Fortune IAS News Daily)** and **FINDER (Fortune IAS News Daily Explainer)** and the **Fortune Prelims Precise** monthly compilation. This magazine will be explained in detail and your queries addressed in a live class we conduct.

At a time when there is no dearth of current affairs materials, our hope is help you get a one-stop solution for all your current affairs needs.

This magazine is a work in progress and your feedback will be appreciated.

We hope that this magazine will serve as a valuable resource for your exam preparation and contribute to your success in the UPSC examination.

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BIOTECHNOLOGY

Syllabus: GS III - Science & Technology

PYQ MAPPING

Q) *What are the research and developmental achievements in applied biotechnology/? How will these achievements help to uplift the poorer sections of society?* ***(2021)***

Q) *Why is there so much activity in the field of biotechnology in our country? How has this activity benefitted the field of biopharma?* ***(2018)***

Q) *Stem cell therapy is gaining popularity in India to treat a wide variety of medical conditions including Leukaemia, Thalassemia, damaged cornea and several burns. Describe briefly what stem cell therapy is and what advantages it has over other treatments?* ***(2017)***

SHORT TAKES

CRISPR-Cas9

- Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) is a DNA sequence which is part of the bacterial defence system.
- Cas9 (CRISPR-associated) is the name of the protein that transfers resistance.
  - It is an enzyme that acts like a pair of molecular scissors, capable of cutting strands of DNA.
- It allows researchers to easily alter DNA sequences and modify gene function.
- In 2020, Emmanuelle Charpentier and Jennifer A. Doudna was awarded the Nobel Prize in chemistry for discovering CRISPR-Cas9.

WHY IN NEWS

Recently, the Union Cabinet cleared a proposal to bolster biotechnology-based manufacturing, called BioE3 (Biotechnology for Economy, Environment and Employment) Policy for Fostering High Performance Biomanufacturing

INTRODUCTION

- Biotechnology is the application of living organisms or their parts to make technological advances and utilise those technologies in various fields. The modern era of biotechnology started with the discovery of the DNA structure as well as the development of genetic engineering techniques and the polymerase chain reaction.
- In India, biotechnology is driving growth in the bio-economy, which expanded from $35.5 billion in 2014 to over $137 billion in 2022.

APPLICATION OF BIOTECHNOLOGY

FIELD OF AGRICULTURE

- **Genetically Modified Crops (GM Crops):** Development of crops that are resistant to pests, diseases, and herbicides and also enhanced nutritional content in crops.
  - **Examples:**
    - **Disease Resistance: Bt Brinjal** is genetically modified to resist the **Fruit and Shoot Borer (FSB)**, a major pest in brinjal cultivation. The crop contains a gene from the bacterium ***Bacillus thuringiensis*** (Bt), which produces a protein toxic to the FSB pest but safe for humans. However, its introduction in India is still under regulatory review.
    - **Pest Resistance:** The introduction of **Bt cotton**, genetically modified to resist bollworm pests, has been one of the most successful applications of biotechnology in Indian agriculture.
    - **Drought and Salinity Tolerance:**
      - **Drought-Resistant Rice (DRR Dhan 42),** developed by the Indian Council of

Agricultural Research (ICAR). This variety of rice is drought-resistant, allowing farmers in rain-fed regions to grow rice with reduced water availability.

- Salt-Tolerant Rice (CSR 30), developed byCentral Soil Salinity Research Institute (CSSRI). These rice varieties are capable of growing in saline soils, especially in coastal regions of India.
- **ADVIKA, a Superior Drought Tolerant High-Yielding Chickpea Variety**: An improved drought tolerant desi chickpea variety "ADVIKA (NC 7)" was developed by introgression of an ABC transporter gene in the genetic background of JG 16 that enhances seed weight and yield (7% high) under drought stress.

- **Improved Nutritional Value: Golden Rice**- Biotechnology is being used to biofortified crops like rice. Golden Rice, enriched with **Vitamin A**, is being developed to combat malnutrition, which is a major health issue in India.

Plant Tissue Culture

- A method to produce a large number of genetically identical plants from a single plant, ensuring high-quality crop production and faster growth rates.

Marker-Assisted Breeding

- Biotechnology is used to identify specific genes responsible for desired traits in plants, making traditional breeding more efficient.

Sustainable Agriculture

- Biotechnology promotes the development of eco-friendly farming practices that reduce environmental degradation while maintaining productivity.
- **Phytoremediation in Contaminated Soils**: Biotechnology is also applied in bioremediation, where plants or microbes are used to remove contaminants from the soil.

FIELD OF MEDICINE

Gene Therapy: Correcting defective genes responsible for disease development.

- **Example**: Treatment of genetic disorders like haemophilia, cystic fibrosis, and muscular dystrophy.

Gene Editing: Gene editing is a research area that involves altering the DNA of living organisms to study gene function and develop treatments for disease

- **Example**: **CRISPR technology:** CRISPR-Cas9 adapted from a naturally occurring genome editing system bacteria and it allow the bacteria to remember the viruses so as to target the viruses' DNA
- Example: Precision-guided Sterile Insect Technique (pgSIT) uses a CRISPR-based approach to engineer deployable mosquitoes that can suppress populations**Biopharmaceuticals:** Developing drugs through the use of living organisms.
- **Example**: Insulin production for diabetes, monoclonal antibodies for cancer treatment (e.g., Rituximab, Herceptin).

Vaccines: Biotechnological advancements help in developing vaccines by manipulating the genetic material of pathogens.

- **Example**: mRNA vaccines like those for COVID-19 such as Pfizer and Moderna vaccines, produced using biotechnology.

Stem Cell Therapy: Using stem cells to regenerate or repair damaged tissues or organs.

- **Example**: Treatment for conditions like spinal cord injuries, Parkinson's disease, and diabetes.

Diagnostic Tools: Development of biotechnological tools for more accurate and rapid diagnosis.

- **Example**: PCR (Polymerase Chain Reaction) for detecting pathogens, DNA sequencing for diagnosing genetic conditions.

Applications of Transgenic Animals

Research and Disease Models

» **Example**: **Transgenic Mice**

- Transgenic mice are commonly used as models to study human diseases such as cancer, diabetes, Alzheimer's, and cardiovascular diseases.
- Specific genes related to these diseases are introduced into the mice, allowing scientists to study the progression of the disease and develop new treatments.

Production of Pharmaceuticals (Biopharming)

» **Example**: **Transgenic Goats Producing Anticoagulant**

- In transgenic goats, a human gene responsible for producing the anticoagulant protein **Antithrombin III** was inserted. These goats

produce the protein in their milk, which can be extracted and used to treat blood clotting disorders.

Improved Agricultural Traits

» **Example**: **Transgenic Cows**

- Transgenic cows have been developed with improved milk composition. For example, cows have been engineered to produce milk with higher casein content, enhancing cheese production. Others have been modified to resist diseases like mastitis, a common infection in dairy cattle.

Xenotransplantation

» **Example**: **Transgenic Pigs**

- Pigs are being genetically engineered to reduce immune rejection of their organs in humans. These pigs may serve as organ donors in the future for xenotransplantation, which could alleviate the shortage of human organs available for transplantation.

Animal Welfare

» **Example**: **Hornless Cattle**

- Researchers have developed transgenic cattle that are naturally hornless by editing out the gene responsible for horn growth. This reduces the need for dehorning, improving animal welfare and reducing stress on livestock.

SCOPE AND OPPORTUNITY FOR INDIA

Growing Market Size

- According to the Department of Biotechnology (DBT), the Indian biotechnology sector is projected to reach **USD 150 billion by 2025** from USD 70 billion in 2020
- India is ranked among the top 12 biotechnology destinations globally and the 3rd largest in the Asia-Pacific region.
- The biotechnology sector is expected to contribute significantly to the government's vision of a **$5 trillion economy** by 2025.

Energy requirement:

- The Department of Biotechnology is contemplating setting up enzyme-manufacturing facilities to bolster ethanol production.
- The NITI Ayog estimates that India will need about 13.5 billion litres of ethanol annually by 2025–26. Of this, about 10.16 billion litres will go towards meeting the fuel-blending mandate of E20

Biopharmaceuticals

- The **biopharma** segment is the largest contributor to India's biotech industry, comprising **62%** of the total biotech market.
- India is a leader in the production of vaccines, supplying **60% of the world's vaccines**.
- Indian companies like Bharat Biotech and Serum Institute of India played a major role in the production and distribution of COVID-19 vaccines.

Agricultural Biotechnology

- **Genetically Modified (GM) crops**, such as **Bt Cotton**, have increased productivity and reduced pesticide use. Bt cotton covers over **95% of India's cotton-growing areas**, contributing significantly to India's cotton exports.
- Biofortified crops like **iron and zinc-enriched wheat** are being developed to combat malnutrition.
- India's focus on **biofertilizers** and **biopesticides** supports sustainable agriculture. The bio-agri sector is expected to grow to **USD 20 billion** by 2025.

Human Resources and Research

- India has a large pool of **scientific talent** with over **500 research institutes** dedicated to biotechnology.
- Collaboration between academia and industry is strong, leading to innovations in fields such as biopharma, agri-biotech, and industrial biotechnology.

Industrial Biotechnology

- Industrial biotechnology is focused on the production of biofuels, biodegradable plastics, and enzymes for industrial use.
- India has set a target of achieving **20% ethanol blending** in petrol by 2025 under its **Biofuels Policy**, creating opportunities for the production of bioethanol and biodiesel.

Healthcare and Diagnostics

- India's biotech sector has developed indigenous diagnostic tools and therapeutics, especially during

the COVID-19 pandemic.

- **Precision medicine** and **gene therapy** are expected to grow, with innovations in diagnostics, cancer treatments, and rare genetic diseases.

Export Potential

- India's **export of biopharmaceutical products** reached **USD 14 billion** in 2022 and is expected to grow further as demand for affordable and high-quality vaccines and medicines increases globally.

Startups and Innovation Hubs

- Biotech Startups have grown 100 times in the last 8 years from 52 odd startups in 2014 to 6,300 plus presently.
- Innovation hubs like the **Genome Valley** in Hyderabad and the **Biotech Parks** in cities like Bengaluru and Pune are fostering collaboration between academia, industry, and government, driving R&D and commercialization.

GOVERNMENT INITIATIVES AND SUPPORT

BioE3 (Biotechnology for Economy, Environment and Employment) Policy.

- **To address the national priorities, the BioE3 Policy would broadly focus on the following sectors:**
  - high value bio-based chemicals, biopolymers & enzymes
  - smart proteins & functional foods
  - precision biotherapeutics
  - climate resilient agriculture
  - carbon capture & its utilisation
  - marine and space research.
- The policy focuses on promoting innovation through support for research and development (R&D) and entrepreneurship across various thematic sectors.
- **Significance:**

It will accelerate technology development and commercialization by establishing Biomanufacturing & Bio-AI hubs, along with Biofoundries.

By prioritising regenerative bioeconomy models, it will contribute to green growth and support the expansion of India's skilled workforce, creating a surge in job opportunities.

The policy will also strengthen key government initiatives like achieving a 'Net Zero' carbon economy and promoting the 'Lifestyle for Environment' (LiFE) approach.

It will steer India towards accelerated green growth by fostering a circular bioeconomy.

Ultimately, this policy paves the way for a more sustainable, innovative, and adaptable future, outlining a bio-vision for a developed India by 2047.

100% Foreign Direct Investment (FDI) is permitted through the automatic route for greenfield pharmaceutical ventures and the manufacturing of medical devices.

The National Biotechnology Development Strategy 2021-25 seeks to position India as a global leader in biotechnology research, innovation, translation, entrepreneurship, and industrial growth, aiming to establish a USD 150 billion bioeconomy by 2025.

The Department of Biotechnology has supported the creation of **51 Biotech-KISAN hubs,** which aim to connect farmers with scientists and institutions, focusing on sustainable agriculture, soil health, irrigation, and new agricultural technologies.

In the Union Budget 2023-24, the government announced the creation of 5**00 new 'waste to wealth' plants** under the **GOBARdhan scheme,** with a total investment of INR 10,000 crore.

The **GenomeIndia Project** aims to sequence and analyse the genomes of a representative Indian population to better understand genetic diversity and its impact on public health.

CHALLENGES

Regulatory Hurdles

- Complex and evolving regulatory frameworks can delay approvals for biotech products and research.
- **Example:** The approval process for genetically modified organisms (GMOs) is particularly cumbersome, with the moratorium on **Bt brinjal** since 2010 serving as a prime example.

Funding and Investment

- Insufficient funding for biotech startups and research projects, particularly in the early stages, can stifle innovation.
- There is also a lack of venture capital and private investment in high-risk biotech ventures.

Skilled Workforce

- There is a shortage of highly skilled professionals and researchers in the biotech field.

- The current educational and training programs may not fully meet industry needs.

Intellectual Property Issues

- Protecting intellectual property (IP) rights can be challenging, especially for startups. The process of patenting and defending IP can be complex and costly.
- Patent application filing increased by 24.64%, from 66440 in 2021-22 to 80211 in 2022-23, still enforcement challenges persist.

Public Perception and Acceptance

- Public scepticism and misinformation about biotech products, such as GMOs and vaccines, can impact market acceptance and regulatory approvals.

Ethical Issues

- Ethical concerns related to genetic modification, cloning, and other biotech practices can pose challenges to public acceptance and regulatory approval.

Global Competition

- Competing with established biotech hubs like the US and Europe can be challenging due to their advanced infrastructure and funding.

WAY FORWARD

Regulatory Reimagining:

- **Unified Authority**: Create a Biotechnology Regulatory Authority of India (BRAI) to streamline biotech project approvals through a single-window clearance system.
- **Risk-Based Assessment**: Adopt a risk-based approach to expedite approvals for low-risk innovations while maintaining strict oversight for high-risk areas.

Capital Catalyst:

- **Biotech Investment Fund**: Establish a Biotechnology Investment Fund with public-private partnerships offering grants, soft loans, and equity investments at various development stages.
- **Crisis-Responsive Funding**: Use successful models like the Covid Suraksha mission to create funding mechanisms for future crises.

Talent Transformation:

- **Skill Development Program**: Launch a National Biotechnology Skill Development Program with industry internships and interdisciplinary education in fields like synthetic biology and bioinformatics.
- **Industry-Academia Integration**: Integrate biotech modules into engineering and business programs to build a versatile workforce.

Infrastructure Imperative:

- **Shared Facilities**: Develop shared high-end research facilities and specialised biotech manufacturing zones with plug-and-play setups and streamlined approvals.
- **Cold Chain Investment**: Upgrade and expand cold chain infrastructure for biopharmaceuticals.

IP Empowerment:

- **Strengthen IPR**: Increase patent examiners specialising in biotechnology and reduce processing times.
- **Biotech Patent Pool**: Create a patent pool for collaborative research and technology transfer, focusing on neglected diseases and agricultural innovations.

Manufacturing Expansion:

- **Expand PLI Scheme**: Extend the Production Linked Incentive (PLI) scheme to more biotech products and establish Biotech Manufacturing Corridors in key states like Karnataka, Telangana, and Maharashtra.

CONCLUSION

India's National Biotechnology Development Strategy envisions positioning the country as a "Global Biomanufacturing Hub" by 2025, reflecting its ambition to lead in biotechnology innovation, research, and production. By leveraging cutting-edge technologies, sustainable practices, and strong policy support, India can emerge as a leader in biomanufacturing and contribute significantly to the global bioeconomy.

SAMPLE QUESTION

Q) Discuss the key opportunities and challenges India faces in its National Biotechnology Development Strategy as it aims to position the country as a "Global Biomanufacturing Hub" by 2025. **(15 marks)(250 words)**

ARIGHAAT NUCLEAR SUBMARINE

Syllabus: GS III - Defence

PYQ MAPPING

Q) *How is the S-400 air defence system technically superior to any other system presently available in the world?* ***(2021)***

SHORT TAKES

K-15 and K-4 Missiles:

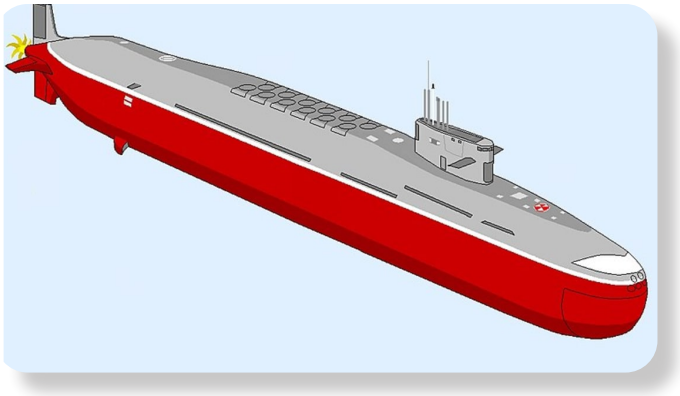
- Both missiles in India's K missile family, which is developed by the Defence Research and Development Organisation (DRDO):
- **K-15:**
  - The K-15 Sagarika is an Indian submarine-launched ballistic missile (SLBM) with a range of approximately 700 km.
- **K-4:**
  - An intermediate-range SLBM with a range of 3,500 kilometres. The K-4 is 10 metres long and weighs 20 tonnes.

INTRODUCTION

The second Arihant-Class submarine, **INS Arighaat,** was commissioned into the Indian Navy at Visakhapatnam in the presence of the Defence minister, who expressed confidence that Arighaat would bolster India's nuclear triad, enhance nuclear deterrence, contribute to regional strategic balance and peace, and play a pivotal role in ensuring the nation's security.

WHY IN NEWS

Recently, the second Arihant-Class submarine 'INS Arighaat' was commissioned into the Indian Navy in the presence of Raksha Mantri in Visakhapatnam.



INS Arighaat

- INS Arighaat is India's second indigenously built nuclear-powered ballistic missile submarine (SSBN), following the country's first, INS Arihant. However, it surpasses its predecessor in sophistication, incorporating significant indigenous technological advancements.
- The submarine was constructed at the Indian Navy's **Ship Building Centre (SBC)** in **Visakhapatnam.**

FEATURES OF INS ARIGHAAT

- **Enhanced Endurance**: Powered by an 83 MW pressurised light-water nuclear reactor, it can remain submerged for extended periods compared to conventional submarines, which need to surface regularly for battery charging.
- **Armed with Nuclear-Tipped Missiles**: INS Arighat is equipped with four launch tubes, capable of carrying 12 K-15 Sagarika submarine-launched ballistic missiles (SLBMs) with a 750 km range or four K-4 SLBMs with a 3,500 km range.
- **Speed and Size**: With a displacement of around 6,000 tonnes, INS Arighaat can reach speeds of 12-15 knots (22-28 km/h) on the surface and up to 24 knots (44 km/h) when submerged.
- **Advanced Stealth Technology**- The submarine features advanced stealth technology to reduce its detectability by enemy sonar systems. Its design incorporates lessons learned from INS Arihant, improving its operational effectiveness and survivability.

IMPORTANCE

Strengthening the Nuclear Triad:

- With its nuclear-tipped **submarine-launched ballistic missile** (SLBMs), INS Arighat completes India's nuclear triad, providing the capability to launch nuclear strikes from land, air, and sea.
- The nuclear-capable Agni 2, Agni 4, and Agni 5 missiles can be launched from land, and fighter aircraft of the Indian Air Force such as the Rafales, Su-30MKIs, and Mirage 2000s can deliver nuclear warheads.

Enhancing Nuclear Deterrence:

- The submarine's ability to carry both **K-15 and K-4 missiles** extends India's nuclear deterrence range, ensuring a robust defence posture against potential threats from regional adversaries.

Strategic Balance in the Region:

- As one of the few nations with nuclear-powered submarines, India's strategic position in the Indian Ocean Region (IOR) is significantly bolstered, contributing to the regional balance of power and ensuring peace through deterrence.

Indigenous Defense Capability:

- The submarine's development highlights India's growing self-reliance in defence technology, showcasing the capability to build and maintain sophisticated nuclear-powered submarines domestically.

Security of Sea Lanes:

- INS Arighat's deployment ensures the protection of key sea lanes of communication in the Indian Ocean, critical for India's trade and energy security.

Symbol of Power Projection:

- Possessing a submarine of this class enables India to project power far beyond its shores, signalling its naval prowess and strategic intent on the global stage.

COMPARISON WITH INS ARIGHAAT AND INS ARIHANT

Feature	INS Arihant	INS Arighaat
Commissioning Year	2016	2024
Class	Arihant-class SSBN	Arihant-class SSBN
Displacement	6000 tonnes	6000 tonnes
Speed	12-15 knots (22-28 km/h) on the surface and up to 24 knots (44 km/h) when submerged	12-15 knots (22-28 km/h) on the surface and up to 24 knots (44 km/h) when submerged
Missile Capability	K-15 (700 km range) K-4 (3,500 km range)	Capable of carrying 12- K15 missiles or 4- K4 missile
Reactor Power	83 MW Pressurised Light Water Reactor	83 MW Pressurised Light Water Reactor
Stealth and Navigation	Standard stealth features	Enhanced stealth and navigation systems
Crew Capacity	95 sailors	Slightly larger crew accommodation
Endurance	Decent underwater endurance	Improved endurance and longer deployment
Technological Upgrades	First-generation design	New sonar, electronic warfare, and communications

NUCLEAR SUBMARINES IN INDIA

Nuclear-Powered Attack Submarines (SSNs)

- India's first exposure to nuclear submarine operations came in the late 1980s with a leased submarine from the Soviet Union. The **Charlie-I class SSN INS Chakra** served in the Indian Navy from 1987 to 1991.
  - **Significance**: Although smaller and less advanced than modern nuclear submarines, INS Chakra provided the Indian Navy with invaluable experience in nuclear propulsion technology and maintenance. This experience laid the foundation for India's own SSN and SSBN programs.
  - **INS Chakra-II Lease**: In 2012, India signed a $1 billion agreement to lease a more advanced **Akula-II class SSN** from Russia for a decade. The 8,140-tonne submarine, INS Chakra-II, was inducted into the Indian Navy in 2012.
    - **Features**: Powered by a 190 MW nuclear reactor, INS Chakra-II can reach depths of 600 metres and travel at speeds exceeding 30 knots. With advanced sensors, weapons systems, and nuclear-tipped missiles, it significantly enhanced India's underwater warfare capabilities.
  - **INS Chakra-III**: India has leased another Akula-class nuclear-powered attack submarine from Russia, INS Chakra-III, which is expected to be delivered by 2025. This new submarine will further strengthen India's underwater fleet.

Nuclear Ballistic Missile Submarines (SSBN)

India's SSBN fleet is directly overseen by the Prime Minister's Office (PMO) and the Strategic Nuclear Command, which manage their construction, testing, and operational status.

ATV Project: Initiated in the 1980s, the Advanced Technology Vessel (ATV) project marked India's entry into the design and construction of nuclear-powered submarines, resulting in the creation of the Arihant-class SSBNs.

- **Arihant-Class SSBNs (S2)**: India's first indigenous nuclear-powered ballistic missile submarines, developed under the ATV program, were launched in 2009 and commissioned in 2016. The SSBNs feature a double-hull design with advanced sensors, periscopes, and various weapon systems.
- **INS Arighaat (S3)**: The second nuclear-powered ballistic missile submarine being built under the ATV project, INS Arighaat is an upgraded variant of the Arihant-class. It is designed to carry more K-4 missiles than its predecessor.
- **S4**: Launched in 2023, S4 is the third Arihant-class SSBN. It will have the capacity to carry up to eight K-4 or twenty-four K-15 SLBMs, exceeding the missile capacity of both S2 and S3.

COMPARISON BETWEEN CHINESE AND INDIAN NUCLEAR SUBMARINE CAPABILITIES

Aspect	Indian Nuclear Submarines	Chinese Nuclear Submarines
Submarine Classes	- Arihant-class (INS Arihant, INS Arighaat)	Type 094 (Jin-class) Type 096 (expected)
Number of SSBNs	2 operational (INS Arihant, INS Arighaat)	6 operational (Type 094) Additional in development
Missile Capabilities	K-15 (700 km) K-4 (3,500 km)	JL-2 (around 7,000 km) JL-3 (expected 12,000 km)
Reactor Power	83 MW PWR (INS Arihant)	- Estimated 150 MW PWR (Type 094) Type 096 expected to have advanced reactor
Displacement	6,000 tonnes (INS Arihant)	8,000 tonnes (Type 094) Larger for Type 096
Stealth and Detection	Advanced stealth features Upgraded technology in Arighaat	Advanced stealth technology Enhanced sonar and EW capabilities
Crew Capacity	95 sailors (INS Arihant) Slightly more in INS Arighaat	100 sailors (Type 094)

GOVERNMENT'S FUTURE PLAN

- The government plans to build additional nuclear submarines, along with conventional vessels, under its long-term capability development strategy.
- According to reports, this includes five Arihant-class and six nuclear attack submarines, which will be constructed in three phases.
- In fact, a Rs 40,000-crore project is currently under consideration with the Cabinet Committee on Security for building two 6,000-tonne 'hunter-killer' nuclear-powered attack submarines, which will be armed with torpedoes and land-attack and anti-ship missiles.

CONCLUSION

The induction of advanced platforms like the INS Arighaat highlights India's growing prowess in the field of nuclear-powered submarines. With both SSBNs like the Arighat class and SSNs such as the Chakra series, India is significantly bolstering its underwater defence capabilities, ensuring a robust nuclear deterrence and enhancing its strategic presence in the region.

SAMPLE QUESTION

Q) How does the commissioning of INS Arighaat, along with the development of advanced SSNs like INS Chakra-III, contribute to India's strategic defence and its position in the Indian Ocean Region? **(10 marks)(150 words)**

SPECIAL TOPIC

ASNA AND CYCLONES IN ARABIAN SEA

Syllabus: GS I - Important Geographical phenomenons

PYQ MAPPING

Q) *The recent cyclone on the east coast of India was called "Phailin". How are tropical cyclones named across the world?* ***(2013)***

Q) *Discuss the meaning of colour-coded weather warnings for cyclone-prone areas given by the India Meteorological Department.* ***(2022)***

Q) *Tropical cyclones are largely confined to the South China Sea, Bay of Bengal and Gulf of Mexico. Why?* ***(2014)***

INTRODUCTION

Cyclone Asna, the first cyclonic storm in the Arabian Sea to occur in August since 1976, was named by Pakistan, meaning "the one to be acknowledged or praised." Notably, between 1891 and 2023, only three cyclonic storms have formed in the Arabian Sea during August—those in 1976, 1964, and 1944.

WHY IN NEWS?

Recently, the India Meteorological Department (IMD) reported that Cyclone Asna has formed over the Kutch coast in Gujarat and adjoining areas of Pakistan

SHORT TAKES

El Niño

➢ It is a climate phenomenon characterised by the warming of sea surface temperatures (SSTs) in the central and eastern tropical Pacific Ocean. This warming disrupts typical weather patterns and has global impacts, including:

- **Increased rainfall** in the western coast of South America, leading to flooding and landslides.
- **Drier conditions** in the western Pacific, affecting Australia, Indonesia, and parts of Southeast Asia.

La Niña

➢ It is a climate phenomenon characterised by the cooling of sea surface temperatures (SSTs) in the central and eastern tropical Pacific Ocean. It is the opposite phase of El Niño and has significant global effects:

- **Increased rainfall** and flooding in Australia, Indonesia, and parts of Southeast Asia.
- **Drier conditions** in the western coast of South America, which can lead to droughts and water shortages.
- **Stronger and more active** tropical cyclones in the western Pacific, while reducing storm activity in the Atlantic.

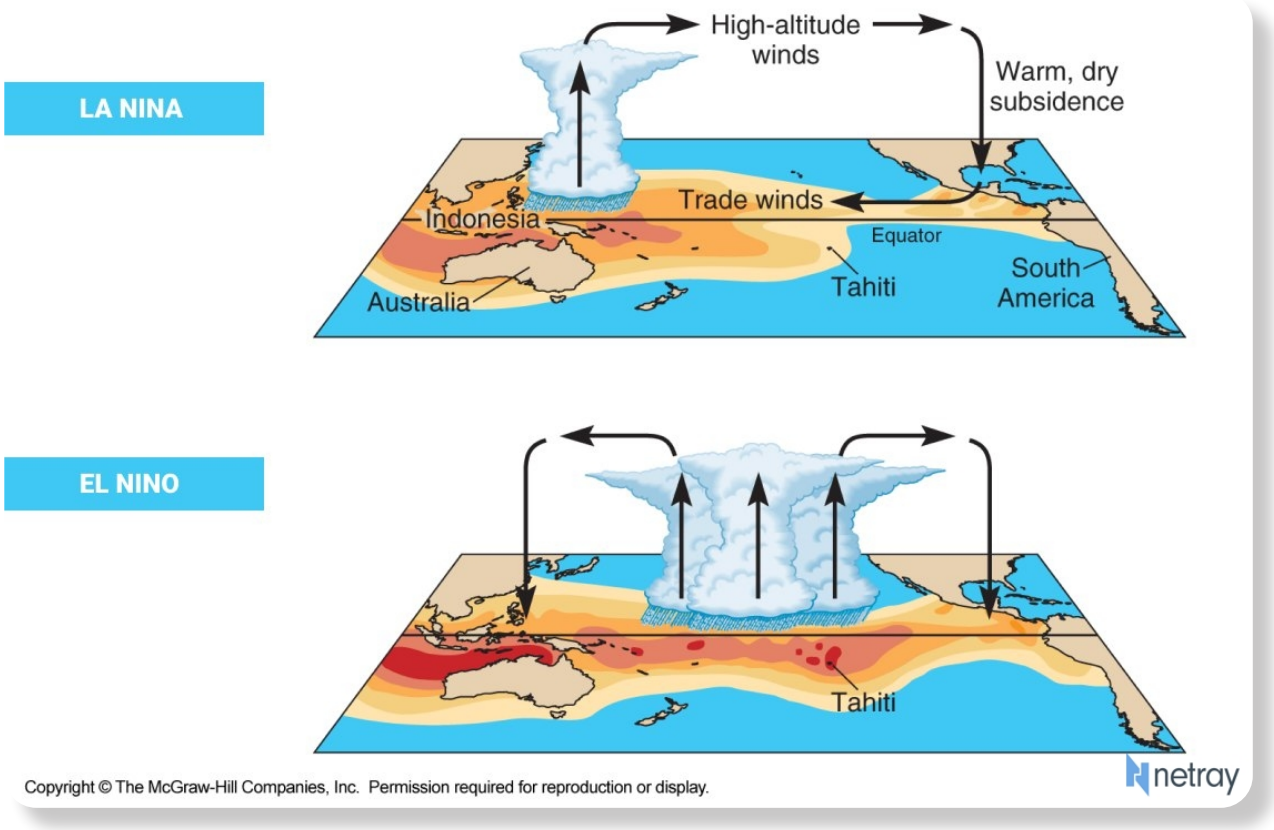
El Niño Modoki

➢ It is a variation of the traditional El Niño event. While in a regular El Niño, warm sea surface temperatures (SSTs) occur in the eastern and central Pacific Ocean, El Niño Modoki features warm SSTs primarily in the central Pacific, with cooler temperatures in both the eastern and western Pacific.

Wind Shear

➢ It refers to the change in wind speed and/or direction either vertically or horizontally in the atmosphere. In the context of cyclones, wind shear plays a critical role:

- **Vertical wind shear:** It is the difference in wind speed or direction between different altitudes.
- Strong vertical wind shear can disrupt the organisation of a cyclone, weakening it or preventing it from intensifying.
- Cyclones form **more easily near the equator** because the winds are more stable (low vertical wind shear).
- In temperate regions, strong winds (westerlies) create high wind shear, which disrupts the formation of cyclones, making it harder for them to develop.



CYCLONE ASNA STANDS OUT FROM OTHER RECENT CYCLONES FOR SEVERAL REASONS

Change in monsoon dynamics:

- Normally, during the monsoon season, high wind shear over the Arabian Sea prevents the formation of cyclones.
- Tropical cyclones usually develop in the North Indian Ocean region (Bay of Bengal and Arabian Sea) during the **pre-monsoon and post-monsoon** (October to December) periods. May-June and October-November are known to produce cyclones of severe intensity that affect the Indian coasts.
- However, in the case of Asna, the interaction between monsoon winds and a low-pressure system over Gujarat provided the necessary conditions for cyclone development.

Unusually Warm Sea Temperatures:

- The Arabian Sea experienced higher-than-normal sea surface temperatures, which helped the depression originating over land to intensify into a cyclone.
- Warm waters above 27-28°C are critical for cyclogenesis, and these conditions were met in the Arabian Sea during August.

Climate Anomalies:

- Cyclones are rare in August because this month falls in the middle of the monsoon season in regions like the Indian Ocean.

During the monsoon:

- **Strong winds and high vertical wind shear** dominate the atmosphere, which disrupts the development of cyclones by tearing apart the rising air masses needed for their formation.
- **Heavy, widespread rainfall** and continuous moisture flow reduce the temperature difference between the sea and the atmosphere, making it harder for the strong low-pressure systems required for cyclones to form.

The formation of Cyclone Asna highlights changing weather patterns potentially influenced by climate change

Tropical Cyclones

Tropical cyclones form over warm ocean waters near the equator.

1. **Warm water heats the air** above, causing it to rise.
2. **As the air rises**, it cools and forms clouds, creating thunderstorms.
3. The rising air leaves behind **low pressure** at the surface, drawing in more warm, moist air.
4. **The Earth's rotation** causes this air to spin, and as it continues to rise and draw in moisture, the storm grows stronger.
5. If the conditions are right, it develops into a tropical cyclone, with strong winds and heavy rains.

» It is anticipated that around 76 per cent of India's coastline is susceptible to cyclones and tsunamis.

» **Conditions for Formation of Tropical Cyclones:**

- A consistent source of heat as tropical cyclones are thermally induced low-pressure systems.
- Large sea surface with a temperature higher than 27° C which is possible only during the late summers i.e. September, October, and November

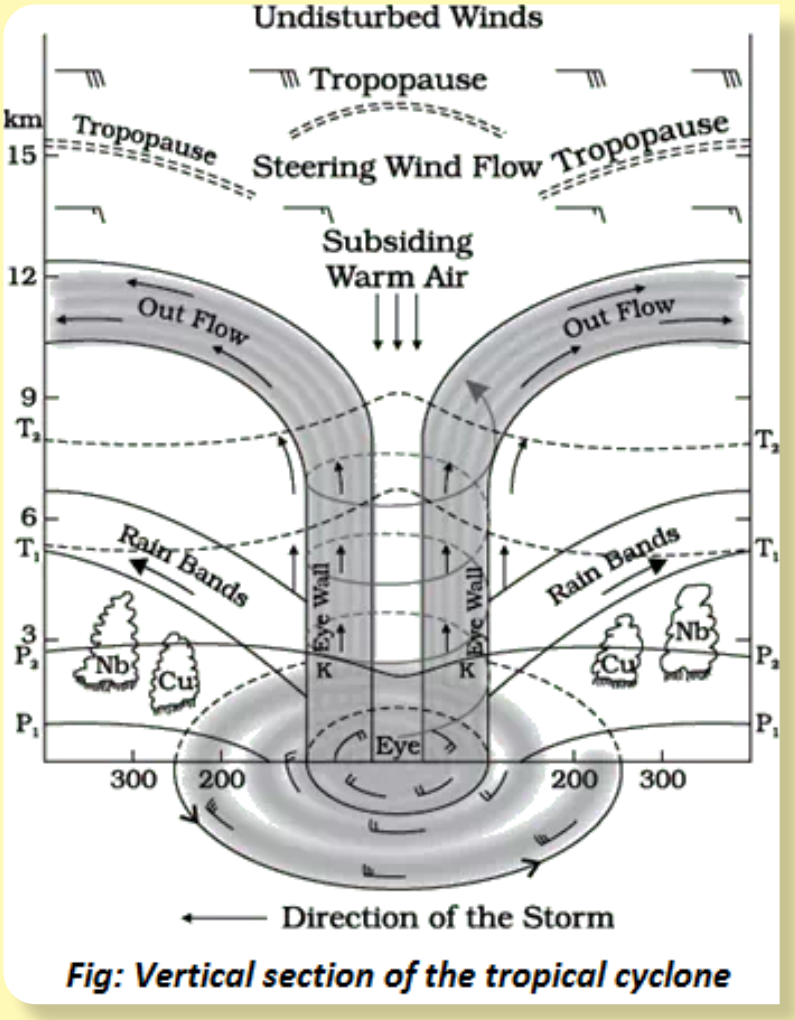


Fig: Vertical section of the tropical cyclone

- Presence of the Coriolis force. It is the result of the earth's rotation and deflects objects to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.
- Small variations in the vertical wind speed (low wind shear).
- A pre-existing weak low-pressure area or low-level-cyclonic circulation;

RECENTLY OCCURED CYCLONES OVER ARABIAN SEA

♣ **Cyclone Biparjoy** (June 2023)

- Originated in the Arabian Sea and intensified into a very severe cyclonic storm.
- It affected parts of **India's Gujarat** and **Pakistan**, causing heavy rains, strong winds, and flooding.

♣ **Cyclone Tauktae** (May 2021)

- A very severe cyclonic storm that intensified rapidly.
- Impacted the **western coast of India**, particularly **Gujarat**, **Maharashtra**, and parts of **Kerala**.
- It caused significant damage to infrastructure, with over 100 deaths and massive economic losses.

♣ **Cyclone Nisarga** (June 2020)

- Formed in the Arabian Sea and made landfall near **Alibag**, Maharashtra.
- It caused damage to infrastructure and crops, especially in coastal Maharashtra and Gujarat.

♣ **Cyclone Kyarr** (October 2019)

- One of the strongest cyclones in the Arabian Sea in decades, reaching **Super Cyclonic Storm** status.
- Passed through the open sea without making landfall but caused heavy rainfall and coastal flooding in Oman, the UAE, and parts of India.

♣ **Cyclone Ockhi** (November-December 2017)

- Originated in the Bay of Bengal and later moved to the Arabian Sea.
- Affected the **Lakshadweep Islands**, **Kerala**, **Tamil Nadu**, and later parts of **Gujarat** and **Maharashtra**.
- It was one of the deadliest cyclones, causing over 200 deaths.

WHY ARABIAN SEA IS SEEING MORE CYCLONIC ACTIVITIES?

Warming Sea Surface Temperatures:

- The sea surface temperature of Arabian Sea has risen by 10 to 12 millidegree Celsius per year in recent decades which has increased the frequency of cyclones.
- The ratio of cyclones in Arabian Sea compared to Bay of Bengal was 1:4 in the 90s but now it has changed to 1:2.
- Currently, seawater up to depths of 50 metres has been very warm that allowed **Cyclone tauktae** to become a VSCS in only 2 days.

Positive Indian Ocean dipole (IOD) phase:

- It refers to warmer sea surface temperatures in the western Indian Ocean relative to the east.
- Warming of Arabian Sea can increase the frequency and intensity of tropical cyclones in the North Indian Ocean.

Low vertical wind shear in the Arabian Sea:

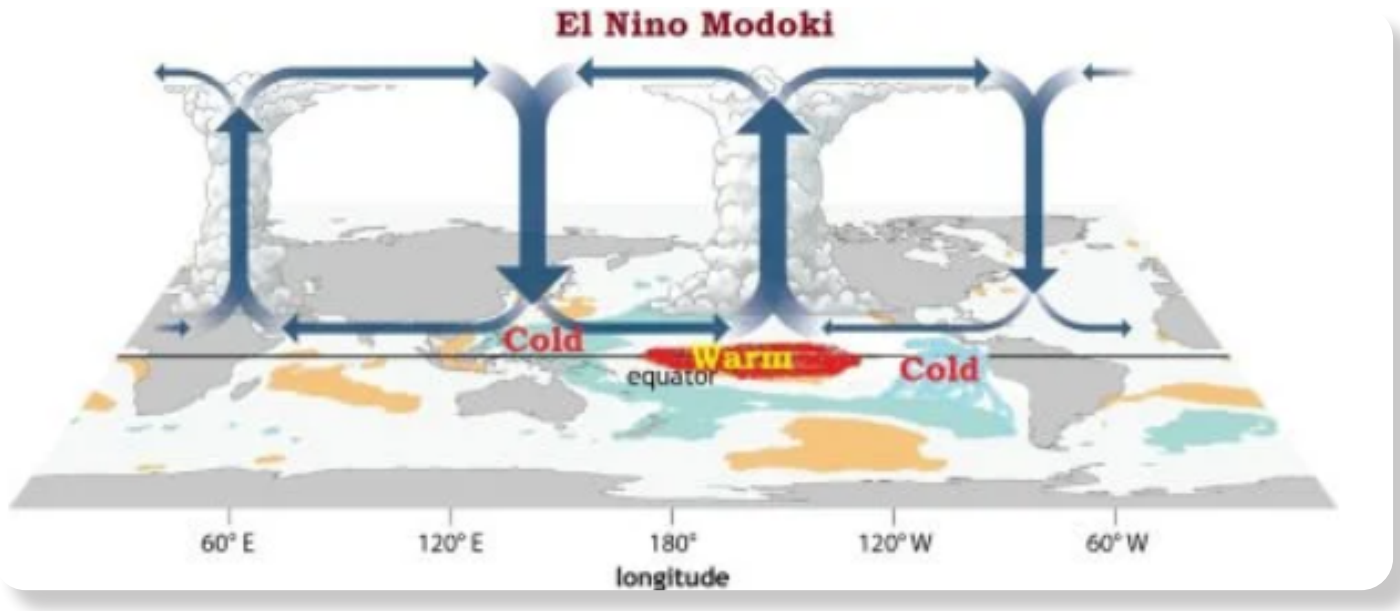
- It significantly contributes to an increase in cyclone formation and intensity, as it allows cyclones to maintain their vertical structure and strengthen without disruption, while high wind shear can disrupt cyclone development by shearing the storm apart and hindering its intensification.

La Nina impact:

- La Niña typically peaks during the October-December period, which coincides with a time when sea surface temperatures are still high due to the delayed cooling of the Arabian Sea after the monsoon.
- The combined effect of reduced wind shear (due to La Niña) and rapidly warming waters (due to climate change) creates a perfect environment for the formation of more intense and frequent cyclones in the Arabian Sea.

Occurence of El Nino Modoki

- The splitting and modification of walker circulation cells have significant impact on the tropical cyclone frequencies over the north Indian Ocean.
- During the El-Niño Modoki years the walker circulation cell split over the central Pacific Ocean.
- The ascending limb of the cell will be over the central pacific and the two descending limbs will be over east Pacific and west Pacific Ocean.
- The descending limb over the western Pacific is close to the Bay of Bengal area, this suppresses the formation of tropical cyclones over the Bay of Bengal during El-Niño Modoki years.
  - But this will not affect the genesis of tropical cyclones over Arabian Sea.



During El-Niño Years

The ascending limb of the walker circulation will be there over east Pacific Ocean, the descending limb will be over/ near to the central and west Pacific regions, so the magnitude of the divergence over western Pacific and Bay of Bengal region will be small, this gives a favourable condition for the formation of tropical cyclones over Bay of Bengal.

IMPLICATIONS

Increased Coastal Damage

- Coastal cities and towns, particularly in **India, Pakistan, and Oman**, face higher risks of flooding, storm surges, and infrastructure damage.
- **Example**: In 2021, **Cyclone Tauktae** caused extensive damage along the western coast of India, particularly in Gujarat and Maharashtra, with massive infrastructure destruction, power outages, and loss of lives.

Threat to Livelihoods

- The livelihoods of fishing communities and farmers are threatened by recurring cyclones, which destroy crops, damage fishing boats, and disrupt trade routes.
- **Example**: After **Cyclone Vayu** in 2019, fishermen in Gujarat suffered significant losses due to damaged boats and prolonged disruptions in their ability to fish.

Impact on Economic Activities

- Ports, oil refineries, and shipping lanes in the Arabian Sea region are highly vulnerable to disruptions from cyclones, affecting trade, shipping, and oil production.
- **Example**: **Cyclone Ockhi** in 2017 disrupted oil extraction operations and shipping along the Indian coast, causing significant economic losses.

Environmental Degradation

- Cyclones can lead to habitat destruction, coastal erosion, and damage to marine ecosystems, including coral reefs and mangroves.
- **Example**: The **2015 Cyclone Chapala** severely damaged the coastal ecosystems of Yemen and Oman, leading to long-term environmental challenges in the region.

SUGGESTIONS

Enhanced Cyclone Monitoring Systems

- Cyclones should be closely monitored using **high-resolution, accurate technology** such as on-site platforms like **buoys** and **moorings**.
- **Buoys** can serve as early warning points by providing real-time oceanic and atmospheric data, while **moorings** help secure vessels and prevent damage.

Strengthening INCOIS (Indian National Centre for Ocean Information Services)

- **INCOIS** should be given **greater autonomy, increased funding, and enhanced human resources** to improve its capability to collect, process, and disseminate data on cyclonic events.
- Improved **research infrastructure** and investment in advanced technology will help better predict cyclone paths and intensities, especially in the Arabian Sea region.

Incorporation of Climate Signals in Weather Models

- **Global warming signals** should be integrated into existing **weather models** to enhance their ability to forecast the intensity and frequency of future cyclones.
- This would help prepare for **more intense and frequent cyclones**, as climate change is driving shifts in cyclone behaviour.

Improved Early Warning Systems and Preparedness

- Governments should invest in **early warning systems** that can alert coastal populations well in advance of an impending cyclone.
- Coastal areas should strengthen **disaster preparedness** and build resilient infrastructure to withstand the impact of stronger cyclones.

CONCLUSION

The rising frequency and intensity of cyclones in the Arabian Sea highlight the urgent need for proactive measures. With climate change increasing sea temperatures and altering weather patterns, enhancing disaster preparedness and infrastructure resilience is crucial to mitigating the impacts on coastal communities, economies, and environments.

SAMPLE QUESTION

Q) Discuss the factors that contribute to the increasing frequency and intensity of cyclones in the Arabian Sea, also mention the implications for coastal communities, economies, and infrastructure. **(15 marks)(250 words)**

RISING WOMAN'S MARRIAGE AGE HIMACHAL & ASSAM PERSPECTIVE

Syllabus: GS I - Salient features of Indian Society, Role of women and women's organisation, population and associated issues

PYQ MAPPING

Q) Is the National Commission for Women able to strategize and tackle the problems that women face at both public and private spheres? Give reasons in support of your answer **(2017)**

Q) "Though women in post-Independent India have excelled in various fields, the social attitude towards women and the feminist movement has been patriarchal." Apart from women education and women empowerment schemes, what interventions can help change this milieu?**(2021)**

WHY IN NEWS

The Himachal Pradesh Assembly raised the minimum marriageable age for women to 21. Meanwhile, the Assam government made it mandatory to register all Muslim marriages and divorces with the government. This also invalidates marriages involving individuals under the legal age.

SHORT TAKES

- **The Prohibition of Child Marriage Act, 2006:** A law in India that makes child marriage illegal and protects victims of child marriage. The act came into force on November 1, 2007.
  - The Child Marriage Restraint Act, 1929, was amended in 1978, where the lawful age of marriage of girls was increased from 15 to 18 years and of boys from 18 to 21 years.
  - The Indian Government enacted the Prohibition of Child Marriage Act of 2006 by replacing the earlier legislation of the Child Marriage Restraint Act, 1929, to ensure that child marriage is eradicated from within the society.

PROVISIONS OF ASSAM'S MUSLIM MARRIAGE LAW

- **Historical Context**: The Assam Muslim Marriages and Divorce Registration Act, 1935, had the provision of registering marriages and divorces through Kazis (Muslim scholars authorised by state government) but it was not mandatory.
- **Mandatory Registration:** Under the new rule, registration of all Muslim marriages and divorces with the government is now compulsory.
- **Legal Age Requirements:** Marriages involving individuals below the legal age were not registered. The legal age for marriage is 18 years for women and 21 years for men.
- **Marriage Ceremony Requirements:** For registration, a proper marriage ceremony must have been conducted. The couple must have been living together as husband and wife.
- **Residency Requirement:** Both parties must have resided in the district of the marriage and divorce registrar for at least 30 days before the marriage.
- **Handling Underage Marriages:** If an officer finds that either party is underage during document scrutiny, the case must be reported to the jurisdictional Child Marriage Protection Officer under the Prohibition of Child Marriage Act, 2006.

PROVISIONS ON PROHIBITION OF CHILD MARRIAGE (HIMACHAL PRADESH AMENDMENT) BILL, 2024

- **Modification of the PCM Act:**This Bill amends the Prohibition of Child Marriage Act, 2006, originally enacted by Parliament
- **Revised Definition of "Child":** The definition of "child" is updated to include anyone under 21 years of age, regardless of gender, removing the previous gender-based age distinction.
- **Uniform Minimum Age for Marriage:** The new legislation standardised the minimum age for marriage to 21 years for all individuals in Himachal Pradesh, irrespective of religious or cultural practices.
- **Impact on Child Marriage Definition:**The amendment changes the definition of "child marriage" to align with the new minimum age requirement, applying uniformly across the state.

Minimum Marriagable Age in India

- **Christian Marriage Act, 1872** & **Hindu Marriage Act, 1955**: It sets a minimum age of 18 for the bride and 21 for the groom for Hindus.
- **Muslim Personal law**: The marriage of a bride who has attained puberty is considered valid — and puberty is presumed, in the absence of evidence, on completion of the age of 15 years.
- **The Special Marriage Act, 1954 & The Prohibition of Child Marriage Act, 2006: Both** prescribe 18 and 21 years as the minimum age of consent for marriage for women and men, respectively.

RELATED JUDGEMENTS

- **The Independent Thought v. Union of India (2017) case:** The Supreme Court's ruling in the case acknowledged that minor wives can be victims of marital rape.
  - However, the earlier law protected husbands from such accusations as marital rape was not criminalized under **Section 375 of the Indian Penal Code (IPC) because of Exception 2**.
    - This exception states that non-consensual sexual intercourse between a husband and wife over 15 years of age is not considered rape.
  - Currently Section 63 of the Bharatiya Nyaya Sanhita (BNS) criminalizes sexual intercourse with a wife who is under 18 years old as marital rape.
- **K.K. Ramesh versus The Government of India(2014)**: Filed at the Madras High Court in 2014, requesting for increasing the marriageable age for men and women to 25 and 21 years, respectively.
  - **Court's Reasoning**: However, Justices S.K. Kaul and M. Sathyanarayanan dismissed the petition expressing concerns about the "mental and psychological maturity" of women, highlighting that a blanket age increase may not be suitable for all individuals.

RELATED COMMISSIONS

Jaya Jaitley Committee:

- On 2nd June 2020, the Union Ministry for Women and Child Development set up the committee to reconsider the minimum age of marriage for women, which was 18 then.
- The committee has recommended the age of marriage be increased to 21 years, on the basis of feedback they received from young adults from 16 universities across the country.
- The committee recommended- increase access to schools and colleges for girls, including their transportation to these institutes from far-flung areas, incorporation of Sex education in schools, ensure Skill and business training for women,etc as the reasons to increase the legal age for women.

The 18th Law Commission of India, 2008:

- It demanded a uniform definition of 'child' across all legislations and recommended that the minimum legal age for marriage for both girls and boys be 18 years.

Arguments for increasing marriageable age

- **Social impact:** Raising the legal age of marriage will enable more girls to complete their education, leading to **increased employability, reduced maternal and infant mortality rates, and a decline in child marriage.**
- **Scientific reason:** The brain's decision-making region matures around age 25 and individuals under 25 may lack the necessary judgement and planning skills for marriage.
  - Therefore, raising the minimum age for marriage to 25 can help ensure **better emotional regulation and maturity** in both men and women.
- **Impact on Newborn Health:** According to the study by **International Food Policy Research Institute (IFPRI)**, in 2019, children born to adolescent mothers (10-19 years) were 5 percentage points more likely to be stunted than those born to young adults (20-24 years), and 11 percentage points more stunted than children born to adult mothers (25 years or older).
  - Children born to adolescent mothers also had 10 percentage points higher prevalence of low weight as adult mothers.
  - It also highlighted other factors, such as lower education among teenage mothers and their poor economic status, which had the strongest links with a child's height and weight measurements..
- **Tackling Child marriage:** UNICEF reports India has the highest number of child brides globally, with over 100 million girls married before the age of 15.
  - Raising the legal age helps align with the global goal of eradicating child marriage by 2030.
- **Contribution to Sustainable Development Goals**: Raising the legal marriage age contributes to SDG 5, which calls for policies that promote gender equality, highlighting the necessity of aligning marriage age laws with women's equal status in society.
- **Ensuring Gender Parity:** If the age of voting and the age to consensually, wilfully, validly enter into a contract is the same for men and women, then equality in the age requirements for marriage must also be instilled.
- **Potential risks on women:** Increasing the age of marriage could inadvertently grant parents greater authority over young women, particularly in patriarchal contexts.
  - This could lead to **increased instances of forced marriages, domestic abuse, and limited educational opportunities for women.**

Arguments against increasing marriageable age

- **Infringement on Personal Freedom:** Raising the legal age for marriage can be seen as limiting individual autonomy, especially for adults who feel mature enough to make decisions regarding marriage at 18. It could restrict the rights of individuals to choose when they want to marry.
- **Economic Factors:** In rural areas, early marriage is often seen as a way to reduce the economic burden on families. Parents may marry off their daughters at a young age to find suitable husbands who can provide for them
- **Ineffectiveness in Addressing Root Issues**: Critics argue that simply increasing the legal age of marriage may not address deeper issues like poverty, gender inequality, or lack of education, which are often the true drivers of early marriage.
- **Focus on Education and Health**: Instead of focusing on age, many believe the priority should be on improving **education**, **healthcare**, and **empowerment** for women, which naturally delays the age of marriage.
- **Potential Increase in Unregistered Marriages**: A higher legal age for marriage might push people to engage in unregistered or illegal marriages, bypassing the formal system.
  - This could make it harder to protect women's rights and enforce laws designed to safeguard them.
- **Disconnect with Social Realities**: In many rural and traditional communities, early marriage is a cultural practice tied to family values and economic considerations.
  - Raising the marriageable age without addressing underlying social norms may not bring the desired changes, and could even **lead to resistance or non-compliance.**
- **Legal Complexities and Inconsistencies:** A higher marriageable age can create legal conflicts with personal and religious laws that allow for earlier marriages.
  - Such conflicts may complicate the legal system and enforcement, leading to inconsistent application of the law.

KEY CHALLENGES

- **Conflicts between Personal and Special Laws:** Introducing changes in personal laws is a major legislative hurdle. Courts have different views on personal versus special laws.
  - For example, in 2021, the Punjab and Haryana High Court upheld a marriage under Muslim personal law despite the Prohibition of Child Marriage Act, ruling that personal law prevails over the special law.
- **Laws May Not Produce Immediate Social Change:** Laws don't always lead to immediate social transformation.
  - Although the marriage age was set at 18 in 1978, child marriage began to decline only in the 1990s, indicating that legislative changes may take time to yield tangible results
- **Impact on Marginalised Communities:** NFHS 4 (2015-16) shows that the median age of marriage is lower among marginalised communities (SCs, STs, and OBCs).
  - Around 70% of early marriages occur in these deprived groups, and increasing the legal marriage age could criminalise their traditional practices without providing substantial benefits.
- **Reducing Self-Choice Marriages:** Many young adults today opt for self-choice marriages across caste and community lines.
  - Increasing the legal marriage age could hinder these couples' rights and lead to societal backlash, limiting individual freedom of choice.
- **Social Attitude and Sex-Selective Abortions:** Increasing the legal marriage age might create pressure in poor families to educate girls until age 21, which could result in higher rates of sex-selective abortions due to socio-economic constraints

WAY FORWARD

- **Empowerment through Extended Repudiation Period**: Increasing the time limit for women to repudiate marriages from two to four years offers greater protection and autonomy.
  - This extension allows women more time to reflect on their marital situation and make thoughtful decisions rather than facing pressure for quick action.
- **Comprehensive Education and Skill Development:** Ensuring access to quality education and vocational training for girls up to the legal marriage age can help them become **financially independent,** making them less vulnerable to forced or early marriages.
- **Strengthening Enforcement Mechanisms:** Effective monitoring and enforcement of child marriage laws are essential. This requires training law enforcement, building robust legal frameworks, and ensuring strong penalties for violations.
- **Community-Based Interventions:** Engage local communities, religious leaders, and influencers in dialogue to foster support for raising the marriage age. Community programs that target patriarchal norms can help shift perceptions in areas where child marriage is prevalent.
- **Financial and Social Support for Marginalised Groups:** Offer social and financial incentives for families from marginalised communities to delay marriage, such as scholarships, subsidies, or welfare programs, which reduce the economic burden and promote long-term benefits for girls.
- **Legal Aid and Counseling Services for Women:** Providing free legal aid and counselling services to women facing early or forced marriages will empower them to seek justice, understand their rights, and make informed decisions.
- **Strengthening Collaborative Efforts with NGOs:** Collaborate with NGOs, civil society organisations, and global agencies to implement campaigns that raise awareness on the adverse effects of early marriage and promote gender equality at the grassroots level.

CONCLUSION

Increasing and equalising the age of marriage for women and men is a crucial step towards promoting gender equality and protecting the rights of women. By preventing child marriage, empowering women to make their own choices, and improving health outcomes, higher age limits contribute to a more just and equitable society. This measure fosters a more inclusive and harmonious community.

SAMPLE QUESTION

Q) Critically analyse how the government's recent proposal to raise the legal age of marriage to 21 years for women is a step towards women empowerment **(10 marks)(150 words)**

UNIFIED PENSION SCHEME

Syllabus: GS II - Welfare Schemes

PYQ MAPPING

Q) *"Policy contradictions among various competing sectors and stakeholders have resulted in inadequate 'protection and prevention of degradation' to environment." Comment with relevant illustration*.**(2018)**

SHORT TAKES

- **All India Consumer Price Index for Industrial Workers (AICPI-IW):** Prepared by the Labour Bureau, an attached office of the M/o Labour & Employment, it is a measure used to gauge the average change in prices paid by industrial workers for a fixed basket of goods and services over time.
- **Dearness Allowance (DA)**: A cost-of-living adjustment paid to employees, pensioners, and retirees, primarily in India, to offset the impact of inflation on their salaries or pensions. It is designed to help maintain the purchasing power of individuals by adjusting their income based on changes in the consumer price index (CPI).

INTRODUCTION

The Unified Pension Scheme (UPS), recently approved by the Modi government, consolidates various pension systems into a single framework. It guarantees a fixed pension, with retirees receiving 50% of their average salary from the last 12 months, adjusted for inflation, if they have 25 years or more of service. The scheme benefits around 23 lakh central government employees and extends to current New Pension Scheme (NPS) participants and retirees.

WHY IN NEWS

On August 24, the Union Cabinet approved the Unified Pension Scheme (UPS), providing an assured pension to government employees who joined after January 1, 2004, under the National Pension System. This optional scheme, effective from April 1, 2025, will benefit 23 lakh Central government employees, with potential coverage extending to 90 lakh if State governments opt in.

Old Pension Scheme (OPS)	New Pension Scheme (NPS)	Unified Pension Scheme (UPS)
A traditional pension system where government employees receive a defined benefit pension after retirement, which is usually 50% of their last drawn salary, without requiring employee contributions during their service.	It is also called the National Pension Scheme. It is a contribution-based pension system introduced in 2004 for government employees, where both the employee and employer contribute to a retirement savings fund which invests in various investment options like equity, corporate bonds, government securities, and alternative investments.. The pension received upon retirement depends on the accumulated amount in the fund.	A newly approved pension plan by the Indian government aimed at unifying existing pension systems. It is also a contributory pension system that provides a fixed pension to retirees, with a benefit based on their average salary and inflation adjustments.

COMPARISON

Feature	Unified Pension Scheme (UPS)	National Pension System (NPS)	Old Pension Scheme (OPS)
Nature of Pension	Guaranteed pension of 50% of average basic salary (last 12 months).	Market-linked, defined contribution plan with variable returns.	Pension calculated as 50% of the last drawn salary.
Government Contribution	18.5% of basic salary and DA.	14% of basic salary and DA.	Entire pension is paid by government
Employee Contribution	10% of basic salary and DA.	10% of basic salary and DA.	No contribution
Pension Guarantee	Fixed pension amount, not subject to market fluctuations.	No guaranteed pension; returns based on market performance.	Fixed pension and Includes regular adjustments for inflation through dearness allowance
Guaranteed Minimum Pension	₹10,000 per month after 10 years of service.	No guaranteed minimum pension.	No guaranteed minimum pension.
Family Pension	Assured family pension (60% of employee's pension).	No specific guarantee; family pension depends on NPS corpus.	50% of pension for spouse after death
Inflation Protection	Indexation of pension, family pension, and minimum pension using AICPI-IW.	No automatic inflation indexation; adjustments depend on corpus growth.	Inflation indexation through DA adjustments
Dearness Relief	Dearness relief is linked to AICPI-IW, similar to serving employees.	No dearness relief, as pension depends on market-linked returns.	Yes, DA converted into DR post-retirement.
Lump Sum on Retirement	Lump sum equal to 1/10th of monthly emoluments (pay + DA) for every six months of service.	No similar provision; NPS provides a lump sum withdrawal option (60% of corpus).	A Central Government servant has an option to commute a portion of pension, not exceeding 40% of it, into a lump sum payment.
Market Dependency	Not dependent on market-linked investments.	Entirely dependent on market-linked investments.	No, pension is fixed and not market-dependent.
Tax Benefits	Yet to be disclosed.	Tax deductions up to ₹1.5 lakh under Section 80 CCE, with an additional ₹50,000 under Section 80 CCD(1B).	Tax-free pension
Eligibility	Only for government employees	Open to both private and government employees, as well as any Indian citizen aged 18-70.	Only for government employees
Switching Options	Employees currently under NPS can opt to switch to UPS.	Eligible to switch to UPS under the new scheme.	No direct switching available to UPS or NPS.

ANALYSIS OF PENSION

ADVANTAGES

- **Guaranteed Pension**: Employees under UPS will receive a pension equal to 50% of their average basic salary from the last 12 months before retirement, provided they have at least 25 years of service.
- **Guaranteed Minimum Pension**: UPS guarantees a minimum pension of ₹10,000 per month for employees with at least 10 years of service.
- **Guaranteed Family Pension**: In the event of an employee's death, their spouse will receive 60% of the employee's pension.
- **Inflation Indexation**: Pension, family pension, and the minimum pension will all be indexed to inflation using the **All India Consumer Price Index for Industrial Workers (AICPI-IW).**
- **Dearness Relief**:Retirees will receive dearness relief, adjusted according to the AICPI-IW, similar to current employees.
- **Lump Sum Payment on Retirement**: Upon retirement, employees are entitled to a lump sum payment equal to 1/10th of their monthly emoluments (pay + DA) for every completed six months of service, in addition to gratuity.
- **Contributions**: UPS requires contributions from both employees (10% of salary) and the government (18.5% of salary). This is an increase from the 14% government contribution under NPS.
- **Lump sum payment at superannuation**: The Unified Pension Scheme provides a lump sum payment at the time of superannuation. This payment will be calculated as 1/10th of the monthly emoluments (Pay + DA) on the date of superannuation for every six months of completed service. Importantly, this lump sum payment will not reduce the amount of the assured pension.

CRITICISM

- **Contribution Requirements and Pension Revision in UPS**:Like the National Pension System (NPS), the Unified Pension Scheme (UPS) requires employee contributions, unlike the Old Pension Scheme (OPS), which did not.
- **Uncertainty Around Pension Revisions in UPS**:UPS seems to lack clear provisions for pension revisions or increases, as seen in OPS.
- **Confusion Over Eligibility and Preference for OPS:**There is ongoing confusion about who can migrate from NPS to UPS and who will benefit from the new scheme, with employee representatives still advocating for OPS.

UNIVERSAL BASIC INCOME

Universal Basic Income (UBI) is a financial policy where all citizens or residents receive a regular, unconditional sum of money from the government, regardless of their income, employment status, or other factors. The key characteristics of UBI are:

- **Universality**: UBI is provided to everyone, ensuring that all individuals receive income support.
- **Unconditional**: Recipients do not need to meet specific criteria or work requirements to receive the benefit.
- **Regular Payment**: Payments are made on a regular basis, such as monthly or annually.
- **Financial Security**: UBI aims to ensure a basic standard of living and reduce poverty by providing a safety net for all individuals.

WorkFREE PILOT PROJECT

- **About:** The project is a collaborative effort between the University of Bath, Montfort Social Institute, Hyderabad and the India Network for Basic Income, with funding from the European Research Council.
  - Under the pilot, an adult gets Rs 1,000 and a child Rs 500 a month for 18 months.
  - The pilot supports **1,250 residents in five slums in Hyderabad.**

WHAT IS UNIVERSAL BASIC INCOME?

It is a form of social security that involves payments to anyone without work or means of livelihood without conditions.

IDEA GAINING GLOBAL CURRENCY

- Slow growth not yielding jobs
- UBI can guarantee some income to everyone
- In poor countries, it can address extreme poverty

NUMBERS TOO LARGE FOR INDIA

Considering the number of people in India, it is fiscally difficult to offer such a dole in India

(Number Of Poor, In Million)

₹3.6 LAKH CRORE THE ANNUAL COST OF GIVING ₹1,500 A MONTH TO 200 MILLION PEOPLE

TARGETED APPROACH

IT IS POSSIBLE TO PROVIDE INCOME SUPPORT TO A TARGETED POPULATION

THIS WILL ALLOW MORE FOCUSED ACTION AGAINST POVERTY

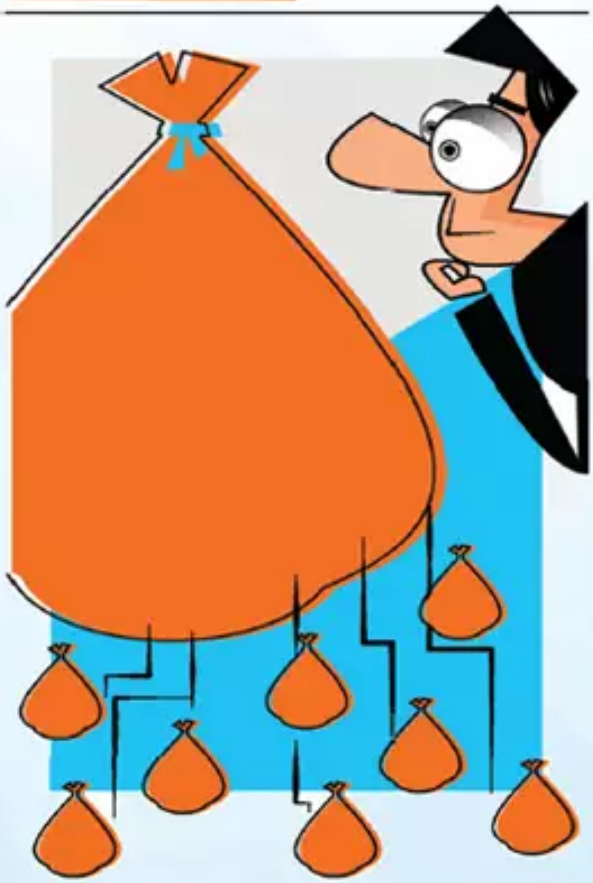
SECC* ALLOWS TARGETED INTERVENTION

(In Crores)

* Socio Economic and Caste Census, 2011

HOUSEHOLDS THAT MAY NEED HELP

₹1.6 LAKH CRORE WILL BE THE COST IF EVERY DEPRIVED RURAL HOUSEHOLD IS GIVEN ₹1,500 A MONTH



CASE FOR UBI

- Best way of addressing poverty by providing a subsistence dole
- It can help cut down on multiple welfare schemes
- Direct cash transfer will reduce pilferage
- Social inequality will be reduced

CASE AGAINST UBI

- Too costly for government to implement
- Discourage people from seeking employment
- Temptation to withdraw other benefits

CHALLENGES IN IMPLEMENTATION

- **Fiscal Burden:** The guaranteed pension amount, especially for those with 25+ years of service, could increase the government's financial liabilities, straining public finances in the long term.
- **Transition from NPS to UPS**: Shifting current New Pension Scheme (NPS) participants to UPS may create administrative and legal complexities, and could lead to dissatisfaction among employees who prefer the market-linked NPS.
- **Inflation Adjustments**: Ensuring regular inflation-adjusted pensions might pose challenges in times of high inflation, making it difficult for the government to maintain adequate pension levels without excessive expenditure.
- **Inclusion of Retired Individuals:** Extending the benefits of UPS to already retired individuals could increase the pension outlay significantly, potentially disrupting the financial planning of the pension system.

WAY FORWARD

- **Phased Implementation**: Introduce the UPS gradually to manage the transition smoothly and address unforeseen issues as they arise.
- **Enhanced Administrative Framework:** Strengthen administrative mechanisms and ensure robust data management to handle the increased volume of pension applications and disbursements.
- **Financial Planning and Sustainability**: Develop comprehensive financial models and strategies to ensure the scheme's long-term viability, including regular assessments and adjustments based on economic conditions.
- **Stakeholder Engagement:** Engage with employees, pensioners, and other stakeholders to communicate changes clearly and address concerns, ensuring broad support and understanding of the scheme.
- **Technological Integration:** Leverage technology to streamline pension processing, improve transparency, and reduce administrative costs, enhancing overall efficiency.
- **Regular Monitoring and Evaluation:** Implement a system for continuous monitoring and evaluation to identify issues early, measure the scheme's effectiveness, and make necessary adjustments.
- **Training and Capacity Building:** Provide training for officials and staff involved in the scheme to ensure they are well-equipped to manage the new system effectively.

CONCLUSION

The implementation of the Unified Pension Scheme (UPS) presents both opportunities and challenges, particularly in balancing financial sustainability with employee benefits. While it promises a secure retirement for many, careful planning is essential to avoid long-term fiscal strain. A phased and well-regulated approach can ensure its success while addressing potential administrative and economic hurdles

SAMPLE QUESTION

Q) The Unified Pension Scheme (UPS) seeks to streamline pension systems and provide financial security for government employees post-retirement. Discuss the potential benefits and challenges of implementing the UPS in India, considering its impact on fiscal sustainability, employee welfare, and the broader economy. **(10 marks)(150 words)**

POLYGRAPH, NARCOTESTS AND RIGHTS

Syllabus: GS II - Government policies and interventions for development in various sectors

PYQ MAPPING

Q) *Though the Human Rights Commissions have contributed immensely to the protection of human rights in India, yet they have failed to assert themselves against the mighty and powerful. Analysing their structural and practical limitations, suggest remedial measures* ***(2021)***

SHORT TAKES

Central Bureau of Investigation (CBI): Governed by the Delhi Special Police Establishment Act, 1946, which provides the legal framework for its operations. Established in 1963, the CBI operates under the **Ministry of Personnel, Public Grievances and Pensions,** and is tasked with investigating complex and high-profile criminal cases, including corruption, economic offences, serious crimes, and other cases of national or inter-state significance.

WHY IN NEWS

The Central Bureau of Investigation (CBI) conducted a second round of polygraph tests on several individuals, including former medical college principal Sandip Kumar Ghosh, after he provided inconsistent responses during initial questioning. The inconsistencies in Ghosh's statements raised concerns, prompting additional tests for him, along with doctors and police volunteers connected to the case

INTRODUCTION

Polygraph tests and narco-analysis are investigative tools used to extract information from individuals by **measuring physiological responses or inducing a drugged state**, respectively. However, their use raises significant concerns about fundamental rights, particularly the **right against self-incrimination guaranteed under Article 20(3)** of the Indian Constitution. The debate centres on balancing effective law enforcement with the protection of individual liberties and the right to privacy.

DECEPTION DETECTION TESTS

Deception detection tests (DDTs) are scientific protocols implemented to discern probable deception during interrogation. These tests include narco-analysis, polygraph tests, and brain mapping.

Narco analysis

- **Definition:** Narco Test refers to the practice of administering **barbiturates or certain other chemical substances, most often Pentothal Sodium**, to lower a subject's inhibitions, in the hope that the subject will more freely share information and feelings.
- **Process:** A person is able to lie by using his imagination. In the Test, the subject's inhibitions are lowered by interfering with his nervous system at the molecular level by administering the drug.
  - Because the drug is thought to weaken the subject's resolve to lie, it is often referred to as a "**truth serum.**"

Polygraph tests

- **Definition:** It is an examination, which is based on an assumption that there is an interaction between the mind and body and is conducted by various components or the sensors of a polygraph machine, which are attached to the body of the person who is interrogated by the expert. The machine records the blood pressure, pulse rate and respiration and muscle movements.
- **Process:** Polygraph test is conducted in three phases- a pre-test interview, chart recording and diagnosis.

- The subject is questioned and the reactions are measured.
- A baseline is established by asking questions whose answers the investigators know.
- Deviation from the baseline is taken as a sign of a lie.
- All these reactions are corroborated with other evidence gathered.

Brain mapping

- **Definition:**It measures a subject's neural activity, specifically brainwaves, using electrodes attached to the face and neck.
- **Process:** It operates on the principle that the brain generates distinctive brain waves when exposed to familiar stimuli, such as an image or a sound.

JUDGEMENTS AND GUIDELINES

Rojo George v/s Deputy Superintendent of Police(2006) :

- **Opposition to Narco-Analysis**: The suspect argued that Narco-Analysis could cause **severe complications like low blood pressure and heart rate changes**, citing issues with dosage accuracy based on individual factors.
- **Issue of Testimonial Compulsion**: The suspect claimed the test violated **Article 20(3)** of the Constitution, which protects against self-incrimination, though bodily samples (like blood) are exempt.
- **Court's View**: The court ruled that Narco-Analysis is a scientific, expert-administered test, not custodial interrogation, necessary for modern crime investigation.
- **Judgement**: Despite potential risks, the court allowed Narco-Analysis, comparing it to any medical procedure where adverse reactions may occur.

Dinesh Dalmia v. State (2006):

- The Madras High Court noted that using deception detection tests did not amount to **"testimonial compulsion."**
- **Safety Assessment:** The Court regarded these scientific methods as a safer alternative to custodial violence for extracting information.

Sh. Shailender Sharma v. State & Another (2008):

- **Court Assertion**: In this case, the Delhi High Court emphasised balancing thorough investigations with the protection of individual rights.The Court stated that narco-analysis tests do not suffer from constitutional infirmity and are a useful investigative tool.
- **Judicial Decision**: The Court permitted the administration of narco-analysis tests, viewing them as a supportive measure in criminal investigations.

Selvi vs State of Karnataka & Anr (2010):

- **Violation of Rights**: The Supreme Court in *Selvi vs State of Karnataka* ruled that using narco analysis, brain mapping, and polygraph tests without consent infringes on the **right against self-incrimination** under **Article 20(3)** and the **right to privacy** under **Article 21** of the Constitution.
- **Admissibility of Evidence**: The Court held that any evidence obtained through these techniques **without the suspect's voluntary consent is inadmissible** in court.
- **Guidelines**: Additionally, it required that the guidelines set out by the National Human Rights Commission(NHRC) in 2000 for administering these tests be strictly adhered to.

NHRC Guidelines on Polygraph Test(2000)

- **Voluntary Consent**: No polygraph (lie detector) tests should be administered without the accused's consent. The accused must be given the option to choose whether to undergo the test.
- **Access to Legal Counsel**: If the accused agrees, they must be provided with access to a lawyer, and the police and lawyer must explain the physical, emotional, and legal implications of the test.
- **Consideration of Detention**: The magistrate must consider all factors related to the accused's detention, including its length and the nature of the interrogation.
- **Independent Recording**: The polygraph test should be recorded by an independent agency, like a hospital, in the presence of the accused's lawyer.

DECEPTION DETECTION TESTS AND FUNDAMENTAL RIGHTS

- **Right Against Self-Incrimination (Article 20(3))**: Deception Detection Tests (DDTs) like narco-analysis, polygraph, and brain mapping, when conducted without consent, violate the constitutional right against self-incrimination under Article 20(3), which protects individuals from being forced to testify against themselves.
- **Right to Privacy (Article 21)**: In the *Selvi vs. State of Karnataka* case, the Supreme Court ruled that involuntary administration of DDTs breaches the right to privacy, which is a part of the right to life and personal liberty under Article 21 of the Indian Constitution.

NEED FOR DECEPTION DETECTION TESTS

- **Enhancing Investigative Efficiency:** Deception detection tests provide investigative tools that can aid in uncovering the truth in complex cases where traditional methods might fall short. They help in **narrowing down suspects and validating witness statements.**
- **Addressing Sophisticated Crimes:** Modern criminals often use sophisticated methods that challenge conventional investigative techniques. Deception detection tests offer advanced means to address and analyse the complexities of such crimes.
- **Reducing Reliance on Confessions**: By using deception detection tests, law enforcement can reduce the undue reliance on confessions, which might be obtained under duress or false pretences, thereby improving the reliability of the investigative process.
- **Preventing Wrongful Convictions:** Deception detection tests can help in distinguishing between truthful and deceptive information, potentially preventing wrongful convictions and ensuring that justice is served based on accurate information.
- **Facilitating Psychological Profiling**:These tests can provide insights into the psychological state of suspects, which can be valuable in understanding their motives and behavioural patterns, aiding in more effective interrogation and case management.

KEY CHALLENGES

- **Reliability:** No deception detection tests are scientifically proven to be 100% accurate, which raises questions about their reliability.
  - **Example**: In a 2010 paper in the Indian Journal of Medical Research, psychiatric expert Suresh Bada Math criticised lie-detection techniques, noting their questionable effectiveness in real-world settings.
    - He highlighted the unreliability of polygraph tests, arguing that the physiological indicators like heart rate and blood pressure used to detect lies lack empirical validation.
- **Exploitation:** These tests can affect those unaware of their rights or unable to access legal advice, leading to potential abuse.
- **Human rights:** The compulsory administration of technique is an unjustified intrusion into the mental privacy of an individual. It would also amount to `cruel, inhuman or degrading treatment' with regard to the language of evolving international human rights norms.
  - **Example**: In The Truth Machines: Policing, Violence, and Scientific Interrogations in India, Jinee Lokaneeta cites cases like the **2007 Mecca Masjid blasts and the 2006 Mumbai blasts**, where narco analysis was forcibly administered, sometimes with physical abuse, leading to false confessions.
- **Margin of errors:** The premise behind these tests is questionable because the measured changes in physiological responses are not necessarily triggered by lying or deception. Instead, they could be triggered by nervousness, anxiety, fear, confusion or other emotions.
- **Mental state of the respondent:** The mental state of the subject is also vital since a person in a state of depression or hyperactivity is likely to offer highly disparate physiological responses which could mislead the examiner.
- **Memory-hardening:** It is a process by which the subject has created and consolidated false memories about a

particular incident. This commonly occurs in respect of recollections of traumatic events and the subject may not be aware of the fact that he or she is lying.

- **Example**: A 2019 study conducted in the United States flagged high false positive rates and noted that individuals can train themselves to beat a polygraph.

Ethical dilemma: The principle of the Indian legal system is based on the fact that until proven guilty, a person is innocent and an innocent cannot be convicted. Hence, subjecting a person to narcoanalysis without his consent will surely undermine his individual rights which are absolutely negating the principle of a right based society

WAY FORWARD

Consent and Decency: The administration of these tests must be consensual in such a way that it respects the dignity and rights of the individuals involved.

Judicial Oversight: Courts should closely monitor the use of deception detection tests (DDTs) to ensure that their application follows the legal framework and does not infringe on constitutional rights. Judicial sanction should be mandatory before administering these tests, with strict guidelines for their use.

Transparency: Transparency in the application of DDTs is essential to maintain public trust. All procedures should be documented, with clear protocols to safeguard the rights of the accused while ensuring investigative integrity.

Periodic Review of Laws: The legal provisions governing the use of scientific methods in investigations should be periodically reviewed to keep pace with technological advancements and changing societal values, balancing efficiency with protection of fundamental rights.

Training and Oversight for Investigators: Law enforcement officials conducting or overseeing these tests should undergo rigorous training to ensure ethical conduct and compliance with legal norms, reducing the potential for misuse or coercion.

Focus on Alternative Investigative Methods: Emphasis should be placed on improving conventional investigative techniques and forensic capabilities to reduce over-reliance on DDTs, ensuring that they are used as supplementary tools rather than primary methods.

CONCLUSION

In conclusion, while Deception Detection Tests (DDTs) such as polygraphs and narco-analysis can aid in investigations, their use must be carefully regulated to protect fundamental rights. Ensuring that these tests are administered with informed consent and under stringent legal and ethical standards is crucial for maintaining justice and individual dignity. Balancing scientific advancement with respect for constitutional protections will help uphold the integrity of the legal process while safeguarding human rights.

SAMPLE QUESTION

Q) Evaluate the role of deception detection tests in modern criminal investigations. In what ways can the use of these tests be balanced with the need to protect fundamental rights such as the right against self-incrimination and the right to privacy? **(10 marks)(150 words)**

ETHICS - CASE STUDY

Q) As the District Education Officer in a tribal district, you've identified a need to establish new schools in several Zila Panchayats, which currently only have private schools managed by Zila Panchayat members. When you proposed setting up these new schools, the Zila Panchayat rejected the proposal, citing concerns about land acquisition due to the district's tribal status. However, the true reason seems to be that their own private schools would face competition. Convincing the Gram Sabhas to approve land acquisition for new schools is proving difficult, as many Gram Sabha members are affiliated with the Zila Panchayat.

a. What are the options available to you? Explore each option vis-à-vis constraints.
b. What will be your course of action?

ETHICS - EXAMPLES

1. **Social Capital:** A stabbing incident which killed a class 10 student in Udaipur by his schoolmate, quickly stormed up into communal violence. Mobile internet was suspended and additional forces deployed to maintain order.
2. **Gandhian Principle:** Thiruvananthapuram is launching Kerala's first Gandhian-inspired dispute resolution system, focusing on mediation within local self-government institutions through the Gandhian Initiative for Social Harmony (GISH). This project aims to reduce judicial pendency by promoting cost-effective, grassroots conflict resolution.
3. **Determination**: In 2020, Sravanthika S.P., a transgender woman from Alappuzha, turned 2.75 acres of fallow land into a successful integrated farm, earning her the State government's award for best transgender farmer. Her journey, driven by resilience and a desire for independence, reflects both agricultural success and personal triumph against societal challenges.
4. **Social Values/Religion:** Urumbachan Gurusthanam, near Thottada in Kannur, is a simple circular shrine where devotees worship Urumbachan, the invisible "Father Ant," believed to protect homes from ants. The shrine, connected to the nearby Udayamangalam Ganapathy Temple through local lore, embodies centuries-old traditions, with special rituals observed on days like Sivaratri and Sankramam.
5. **Social Media/Lack of empathy:** Fitness influencer Rajat Dalal, previously arrested for kidnapping and assault, is now under investigation for a hit-and-run incident on a Delhi-NCR highway, captured on video and widely circulated online. The video, showing Dalal driving recklessly and dismissing the accident, has sparked public outrage, prompting authorities to initiate action despite no formal complaint being filed.
6. **Civil Action/Environment Ethics:** Southern Railway has responded to complaints about uncleared garbage near Kochuveli railway station, taking urgent action after the issue was raised by Save Wetlands International Movement (SWIM). The Railway acknowledged that a delay by the contractor led to the waste accumulation, but measures have since been implemented to properly dispose of the garbage.
7. **Racism**: Chinese tennis star Zheng Qinwen faced racist abuse during her US Open match against Donna Vekic, with courtside chants of "yellow banana" directed at her. The incident sparked outrage on Chinese social media, trending on Weibo with over 1.65 million views before being removed.
8. **Resilience**: Simran Sharma, born with vision impairment and bullied during her childhood, has triumphed as a world-class runner and was recently crowned the 200m Para World Champion at the World Para Athletics Championships in Japan.
9. **Empowerment**: In 2018, Iris Strill and Bishwadeep Moitra launched SilaiWali to empower Afghan refugee women in India by turning upcycled fabric into handcrafted products, creating jobs for over 70 women and diverting 15,000 kg of waste from landfills.

MODEL ESSAY

"Diplomacy is the velvet glove that cloaks the fist of power"

Introduction

- Quote by American writer Robin Hobb
- Meaning: Diplomacy serves as a strategic tool that softens the impact of power, masking its more aggressive aspects with negotiation and tact to achieve national interests.
- Definition of Diplomacy: The practice of managing international relations through dialogue, negotiation, and engagement.

Importance of Diplomacy

- **Soft Power Projection:** Soft power refers to the ability of a country to influence other countries through attraction rather than coercion. It is based on a country's cultural influence, its political values, and its foreign policy**. Eg**: USA's use of cultural diplomacy, such as Hollywood and educational exchanges
- **Conflict Prevention and Resolution:** Means to prevent conflicts through negotiation and compromise.**Eg**: Camp David Accords (1978) -U.S. President Jimmy Carter facilitated peace talks between Israel and Egypt
- **Building Partnerships:** Importance of forming strategic alliances for economic, political, and security benefits.**Eg**: North Atlantic Treaty Organization (NATO) established for collective defence and security.
- **Promoting International Cooperation:** Role of diplomacy in fostering international cooperation on global issues such as climate change, trade, and health. **Eg**: Paris Agreement (2015) to work collectively to combat climate change

Challenges in Diplomacy

- **Balancing National Interests with Global Expectations:** Tensions between pursuing national interests and adhering to global norms and expectations.**Eg**: U.S. withdrawal from the Paris Agreement under President Trump
- **Dealing with Power Imbalances:** Challenges faced by smaller or less powerful nations in diplomatic negotiations with larger powers.**Eg**: Smaller nations like Bhutan or Nepal negotiating with larger neighbours like China and India for territorial disputes.
- **Navigating Complex Geopolitical Landscapes:**Difficulty in managing relationships in a multipolar world with competing interests and alliances.
- **Credibility Issues:** Importance of maintaining trust and credibility in diplomatic relations.**Eg**: Fallout between France and Australia over the cancellation of a major submarine contract by Australia in favour of a new deal with the U.S. and the U.K.

Conclusion

- Reiterate that while power remains a core element in international relations, diplomacy is crucial in wielding that power effectively and ethically.
- Considerations for the evolving role of diplomacy in a rapidly changing global landscape.
- Importance of continued adaptation and innovation in diplomatic strategies to address emerging global challenges.

Sample Quotes

- *To jaw-jaw is always better than to war-war- Winston Churchill*
- *The supreme art of war is to subdue the enemy without fighting -Sun Tzu*
- *Peace is not the absence of conflict, but the ability to cope with conflict by peaceful means - Ronald Reagan*

MAINS JOT DOWN

GS- II - *INTERNATIONAL RELATIONS*

- **India and the US** have signed a **Security of Supply Arrangement (SOSA)** and **Memorandum of Agreement regarding the Assignment of Liaison Officers**, the latest in a series of bilateral military agreements that have enhanced defence and security cooperation between the two countries over the past decade.
- **Security of Supplies Arrangement (SoSA)**: Allows both U.S. and its partners to request priority support for defence-related goods and services to maintain supply chain resilience during critical times.
  - SoSA is not legally binding and not sanction-proofed. India is the 18th SoSA partner of the US.
- **Memorandum of Agreement regarding Assignment of Liaison Officers**: It will increase sharing of information and will entail posting of Indian armed forces officers in key strategic US Commands.

GS- II - *HEALTH*

- Union Health Minister launches **National Medical Register (NMR) Portal.**
- **National Medical Register (NMR) Portal:**
  - The NMR will be a comprehensive database for all allopathic (MBBS) registered doctors in India.
  - It is mandated under Section 31 of the **National Medical Commission (NMC) Act, 2019.**
  - It requires the Ethics & Medical Registration Board (EMRB) of NMC to keep an electronic National Register of licensed medical practitioners' names, addresses, and qualifications.
  - NMR will be linked with the Aadhaar ID of the doctors to ensure the individual's authenticity.
  - **Significance**: strengthens the digital healthcare ecosystem, ensures transparent access to quality medical professionals, consolidates public trust in healthcare etc.

GS- II - *GOVT. POLICIES & INTERVENTIONS*

- The Ministry of Tribal Affairs is running a nationwide campaign for the **PM-JANMAN.**
- **Pradhan Mantri Janjati Adivasi Nyaya Maha AbhiyaN (PM-JANMAN)**
  - Launched to provide PVTG households and habitations with basic facilities such as safe housing, clean drinking water etc. in 3 years.
  - Aims to cover 75 PVTG communities residing in 18 States and 1 UT.
  - Total budgetary outlay is about Rs.24,104 Cr
  - It focuses on 11 critical interventions being implemented by 9 Ministries such as Pucca houses ,connecting roads by the Ministry of Rural Development.

GS- III - *SCIENCE & TECHNOLOGY*

- Recently, the Union Cabinet approved continuation of the three umbrella schemes, merged into a unified central sector scheme namely **'Vigyan Dhara'** of Department of Science and Technology (DST).
- The primary objective of the Vigyan Dhara scheme is to **promote capacity building in science and technology** (S&T), as well as to advance research, innovation, and technology development.

GS- III - *DEFENCE*

- The Indian Army launched the first phase of Project **NAMAN**.
  - It is designed to provide dedicated support and services to Defence pensioners, veterans, and their families.
  - It is centred around **SPARSH (System for Pension Administration Raksha)**, and it also offers Government to Citizen (G2C) services, and Business to Consumer (B2C) services.
    - SPARSH is being implemented for meeting the pension sanction and disbursement requirements for Armed Forces.
  - Project involves the establishment of reception and facilitation centres, enabled through a tripartite MoU between the Indian Army, Common Service Centre (CSC), and HDFC Bank.

GS- III - *AGRICULTURE*

- The Distribution of green manure called **Dhaincha (Sesbania bispinosa)** has recently commenced in **Tamilnadu**.
  - It is generally grown as a green manuring crop in India.
  - Tall annual herb adapted to wet areas and heavy soils.
  - Used for feeding livestock and soil improvement.
- **Green Manuring:**
  - Growing of plants belonging to a leguminous family and incorporating them into soil after sufficient growth.
  - Improves soil structure, Increases water holding capacity and decreases soil loss by erosion.
  - Reduces weed proliferation and helps reclamation of alkaline soils.
  - It adds organic matter to the soil and stimulates activity of soil microorganisms.

GS- III - *ENERGY*

- Food ministry has allowed ethanol producers to participate in the **Open Market Sale Scheme** of rice between August and October 2024.
  - **Open Market Sale Scheme (OMSS)**
    - It refers to offering of food grains (wheat & rice) in the open market at prices, fixed by the Ministry of Consumer Affairs, Food & Public Distribution through e-auction in order to control the price in the market by providing food grains at reduced prices with the aim to curb inflation.
    - The program is run by the Food Corporation of India.
- The Ministry also permitted use of sugarcane juice, sugar syrup, B heavy molasses and C heavy molasses for ethanol production in 2024-2025, reversing last year's ban.
  - Earlier ban was to ensure sugar availability for domestic consumption and price stability.

GS- III - *POLLUTION*

- Food **National Remote Sensing Centre (NRSC)** has conducted a pan-India analysis of fluoride in groundwater:
- **Findings**
  - The NRSC study found that many states in India have fluoride levels in their groundwater that exceed the permissible limits.
  - These states include **Rajasthan (highest)**, Telangana, western Andhra Pradesh, eastern Karnataka, and parts of Haryana, Gujarat, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, Jharkhand, Bihar, and Chhattisgarh.
  - Fluoride contamination is highest during the dry summer pre-monsoon months.
  - Arid regions, especially western India, showed higher contamination than humid areas.

GS- III - *ENVIRONMENTAL POLLUTION AND DEGRADATION*

- The World Meteorological Organization's **State of the Climate in the South-West Pacific 2023 report** showcases that sea level rise is faster in the Pacific Ocean than global average.
- Pacific Islands are at higher risk due to the increasing sea level despite accounting for merely 0.02% of global emissions.
- The '**Samudra Pratap**' is the first indigenously developed **Pollution Control Vessel of the Indian Coast Guard (ICG)**.
- It was built by Goa Shipyard Limited (GSL) and is designed to monitor and address **oil spills** along the country's coastline.
- This vessel enhances India's capability to control marine pollution and protect its maritime environment, reflecting the country's growing focus on environmental security.

CHERRYPICKS OF THE WEEK

THANATOURISM

- Also known as **Dark tourism**, involves visiting sites associated with death, tragedy, and suffering.
- People engage in dark tourism to witness and understand historical and contemporary events' harsh realities.
- **Thanatourism Hotspots in India**
  - **Cellular Jail, Port Blair:** Once a colonial prison, now a national museum, symbolising the suffering endured by freedom fighters.
  - **Roopkund Lake**, **Uttarakhand**: Known for the skeletal remains of many people, the origin of which remains a mystery.
  - **Kuldhara, Rajasthan**: An abandoned village with legends of its residents disappearing overnight due to the demands of a local ruler.

DENGIALL

- It is developed by **Panacea Biotec** and is the India's **indigenous tetravalent dengue vaccine**
- The tetravalent dengue vaccine strain (TV003/TV005) was originally developed by the National Institutes of Health (NIH), USA
- Process Patent: Panacea Biotec is one of three Indian companies to receive the strain, has developed a full-fledged vaccine formulation and holds a process patent for this work.

SONOBUOYS

- They are expendable, **electro-mechanical Anti-Submarine Warfare (ASW)** tactical sonar systems, transmitting information about submarine activity.
- They use a transducer and a radio transmitter to record and transmit underwater sounds.
- Recently, the US approved potential sale of anti-submarine warfare Sonobuoys and related equipment to India.

GREEN SHOOTS

- It is a term generally applied to signs of **recovery from an economic recession.**
- The phrase derives from the green shoots seen in plants that signify health and growth.
- The term was first used by UK chancellor Norman Lamont to refer to economic growth during the economic downturn in the United Kingdom in 1991.

PERPETUAL BONDS

- It They are fund-raising instruments that **do not carry any maturity date as bonds usually do**. Instead, they offer to pay their buyers a coupon or interest at a fixed date for perpetuity.
- Investors can get the principal back by selling the bond in the secondary market, or when the issuer decides to redeem the bonds.
- These bonds have an obligation only to pay interest and are not required to repay the debt.