

**India and France deepen ties****Why in News?**

- French President Emmanuel Macron visited India as the Chief Guest for the 75th Republic Day celebrations.
- During this visit, India and France made significant decisions with the primary focus on enhancing collaboration in the defence sector.

**Indo-France Bilateral Relations**

- Since the establishment of diplomatic ties in 1948, India and France have enjoyed 75 years of close and friendly relations.
- In 1998, India and France elevated their diplomatic relationship to Strategic Partnership which completed 25 years in January, 2023.
- This Strategic Partnership, first for France outside the EU, has been instrumental in the comprehensive growth of India-France relationship.

**Key Pillars of India-France Cooperation:**

- **Defence Cooperation:** The Agreement on Defence Cooperation signed in 2006 and renewed for another 10 years in 2016 gives the framework for all defence cooperation activities between India and France.
  - A DRDO office was opened in the Embassy in 2023 for strengthening technology cooperation.
  - The procurement of Rafale jets as part of India's air power is a testament to the deep defence ties.
- **Space Cooperation:** ISRO and the French Space Agency, CNES have been carrying on various joint research programmes and collaborating in satellite launches.
  - For example, on 22 June 2022, GSAT-24 communication satellite of New Space India Ltd (NSIL) was successfully launched on-board Ariane-5 from Kourou, French Guiana.
- **Civil Nuclear Cooperation:** An agreement on civil nuclear cooperation was signed between India and France in 2008.
  - France is involved in the construction of the Jaitapur Nuclear Power Project. However, the progress here has been slow (the first pact was agreed in 2008).
  - The two sides have also agreed to establish a partnership on Small Modular Reactors (SMR) and Advanced Modular Reactors (AMR).
- **Economic Cooperation:** They have important bilateral investments and trade and commercial cooperation, particularly in sectors involving IT corridors, smart-cities, railways, capital and trade exchanges, skill development, etc.
  - Bilateral trade reached an impressive \$13.4 Bn in 2022-23, marking a significant 7.72% increase from the previous year.
  - France has emerged as the 11th largest investor in India, with FDI inflow of \$10.5 Bn from April 2000 to March 2023.
- **Digital Cooperation:** India-France Roadmap on Cyber security and Digital Technologies was one of the outcomes of the visit of the PM of India to France in 2019.
  - In July 2023, Unified Payments Interface (UPI) was launched from the Eiffel Tower, offering secure and convenient transactions for Indian visitors and NRIs.
- **Culture and Tourism Cooperation:** There are many Indo-French cultural associations which organise various events across France.
  - For example, the Government of India organised 'Namaste France' cultural festival in several cities of France in 2016.
- **Marine and Maritime Cooperation:** Indo-French Maritime Cooperation is based on the India-France Roadmap on Blue Economy and Ocean Governance adopted in 2022.
- **Community in France:** The Indian community, including NRIs in mainland France number around 109,000, largely originating from French enclaves of Puducherry, Karaikal, Yanam, Mahe and Chandernagore.

**News Summary: India and France deepen ties**

- French President Emmanuel Macron was on a two-day State visit to India. He was also the Chief Guest for India's Republic Day.
  - The 2nd Infantry Regiment of the French Foreign Legion also participated in this year's Republic Day Parade.

- This year, we are celebrating the 25th anniversary of the India-France Strategic Partnership.
  - PM Modi was the Guest of Honour at the Bastille Day Parade held on 14 July 2023 in Paris.

**Key outcomes of the visit:**

- Roadmap for India-France Defence Industrial Partnership
  - The main goal of this roadmap is to find areas to work together on making military equipment.
  - This includes designing, developing, and producing things together, as well as creating supply chains for defence goods between the two countries.
  - It aims to foster collaboration in cutting-edge technologies, including robotics, artificial intelligence (AI), autonomous vehicles, platforms, and cyber defence.
  - The defence roadmap will cover both air and space technologies, maritime technology, including underwater domain awareness.
- Defence-space partnership
  - The two sides also signed a new agreement for a defence-space partnership that will see them collaborate on space situational awareness.
- Airbus-TATA chopper deal
  - Tata and Airbus Helicopters have entered into an industrial partnership for the production of H125 helicopters, fostering collaboration in the defence sector.
  - Two mega multi-billion-dollar defence deals in the pipeline between the two countries are currently in the cost negotiation phase. These are:
    - The 26 Rafale-M fighter jets for the Indian Navy's aircraft carriers, and
    - Three additional Scorpene-class conventional submarines.
- Cooperation in satellite launches
  - A MoU was sealed between New Space India Ltd and France's Arianespace, signifying cooperation in satellite launches and advancing space exploration initiatives.
- Introduction of the Young Professional Scheme
  - The scheme facilitates:
    - the exchange of individuals between 18-35 years of age, and
    - extension of visa validity to five years for Schengen visas for Indian students pursuing master's degrees in France.
- Other areas of cooperation
  - Both sides also agreed on cooperation in healthcare, which would include education, training and research, and the use of AI in healthcare.

**Key announcements made during the visit:**

- Year 2026 as the India France Year of Innovation.
- Operationalization of UPI at Eiffel Tower.
- Setting up of a Solar Academy in Senegal under the STAR-C program of International Solar Alliance (ISA).
  - STAR-C programme aims to boost solar power ecosystems in the poorest countries.
  - The initiative is run by ISA in partnership with the United Nations Industrial Development Organisation (UNIDO).
- Establishment of India's Consulate in Marseille and French Bureau de France in Hyderabad.

**AGRICULTURE**

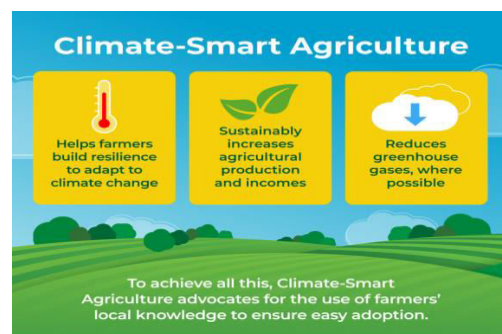
**Adoption of Climate-Smart Agriculture (CSA)**

**Why in News?**

The adoption of climate-smart agriculture (CSA) faces challenges in South Asia, as sustainable practices and technologies struggle to gain widespread acceptance.

**What is CSA?**

CSA, or Climate-Smart Agriculture, is an approach that incorporates a set of agricultural practices and technologies. Its goals are to boost productivity (e.g., precision farming, smart crops), enhance resilience (e.g., zero budget natural farming, agroforestry), and reduce greenhouse gas emissions (e.g., zero tillage, permaculture, organic farming).



**Examples of Climate-Smart Agriculture Practices:**

- Cultivating Climate-Resilient Crop Varieties: Growing crops resistant to temperature changes, pests, and diseases. Example: Drought-tolerant maize in sub-Saharan Africa benefits smallholder farmers.
- Conservation Agriculture: No-till and reduced-tillage cultivation for soil coverage,
- Agroforestry: Integrating trees and shrubs with crops and livestock.
- Precision Irrigation: Drip and sprinkler irrigation maximize water use efficiency.

**Challenges faced in CSA:**

- Weak Organizational Capacities
  - Difficulty reaching farmers due to a large rural population with limited integration with CSA-promoting markets.
  - Limited government resources impact the number of field schools, demonstration plots, and training programs in rural areas.
  - Inadequately staffed and poorly trained government agricultural extension departments for CSA information dissemination.
- Inadequate Targeted Incentives
  - Chemical fertilizers, pesticides, and electricity- and diesel-based irrigation are largely subsidized, while CSA practices lack adequate incentives.
  - Conflicting subsidies, such as those for zero tillage as well as for conventional tillage machinery, hinder the adoption of CSA technologies.
  - Zero tillage is considered a CSA practice that involves minimal disturbance of the soil, promoting conservation and sustainability. On the other hand, conventional tillage involves more intensive soil disturbance.
- Limited Post-Adoption Follow-up
  - Emphasis on adoption initiation with less attention to post-adoption follow-up.
  - Monitoring and evaluating CSA adoption over time is crucial for identifying challenges faced by farmers.
- Inequities in Information Dissemination
  - Inequitable dissemination of CSA information, prioritizing wealthier farmers with greater social networks.
  - Gender inequality persists, with little involvement of women in CSA dissemination processes, despite increasing female participation in farming.

**Benefits of Climate-Smart Agriculture (CSA):**

- Increased Agricultural Productivity
  - Addresses resource-efficient farming for climate variability.
  - Counters climate-induced crop yield decline in India, contributing to adaptation, mitigation, and food security.
  - Various climate-smart techniques enhance production, sustainability, and reliability, while reducing GHG emissions.
  - Site-specific no-tillage in the Indo-Gangetic Plain boosts wheat production, nutrient efficiency, and profitability, and lowers GHG emissions.
- GHG Emission Reduction
  - Crucial for lowering the agricultural sector's 17% share in GHG emissions (2018).
  - Enhances farmland carbon storage.
- Support for Small and Marginal Farmers
  - Significant role in increasing profits for the majority of Indian small and marginal farmers.
  - Biodiversity Conservation
    - Ecosystem-based approach and diverse crop varieties promote the coexistence of cropland and wild animals.
    - Safeguards native plant species, stabilizes pollinator populations and mitigates habitat degradation effects.
- Reduced Impact of Climate Change
  - Promotes crop diversification, and water efficiency, and integrates drought-resistant crop types.
  - It lessens the disruptive effects of climate change and increases resilience to longer-term stressors.

**Promoting CSA:**

- Capacity Building: Raise awareness and provide training for officials, extension workers, and farmers.
- Incentives to Farmers: Support eco-friendly practices (e.g., mulching, crop rotation) and sustainable indigenous technologies.
- Collaborative Approach: Form international/regional partnerships, such as the Youth for Green and Climate-Resilient Agriculture Programme (YCRA) by the Food and Agriculture Organization.
- Other Measures: Encourage private capital investment, implement micro-level policies, and explore additional avenues for CSA promotion.

**Climate-Smart Agriculture Initiatives:**

- Government Initiatives in India: National Adaptation Fund for Climate Change, National Innovation on Climate Resilient Agriculture, Soil Health Mission, Pradhan Mantri Krishi Sinchayee Yojana, Paramparagat Krishi Vikas Yojana, Biotech-KISAN, and Climate Smart Village.
- Public and Private Sector Involvement: Farmer-producer organizations, NGOs, and various entities are actively contributing to CSA adoption.
- Research Programs: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CAAFS) addresses challenges of food security, poverty, and climate change on a global scale, National Innovations in Climate Resilient Agriculture (NICRA)
- World Bank Group: Provides financial support and technical assistance for CSA projects in developing countries.
- Global Alliance for Climate-Smart Agriculture (GACSA): A voluntary platform fostering collaboration among governments, civil society, farmers, research institutions, and the private sector to promote knowledge sharing, policy dialogue, and investment in CSA.
- Climate-Smart Agriculture Youth Network (CSAYN): Comprises young individuals from various countries dedicated to raising awareness and taking action on CSA among youth and other stakeholders.
- National Mission for Sustainable Agriculture (NMSA) One of the missions under the National Action Plan on Climate Change (NAPCC).

**PRELIM FACTS****1. Grantham Inscriptions**

- A team of archaeologists recently discovered two stone inscriptions of 'Grantham' and Tamil dating 11th and 16th centuries respectively at Pazhnchervazhi village near Kangayam.

**About Grantham Inscriptions:**

- Grantha is an important historical script that was once used to write Sanskrit throughout South East Asia and greater Tamil Nadu.
- The word Grantha denotes in Sanskrit 'a literary work'. Evidently, the script used for writing the Sanskrit works obtained the same name.
- At one time, it was prevalent throughout South India.
- When the Malayalam language began to freely borrow words as well as the rules of grammar from Sanskrit, this script was adopted for writing that language and was known as Arya Ezhuthu.
- Both Grantha and Tamil scripts appear alike in modern forms. The evolution of both scripts from Brahmi was also more or less similar.
  - The development of the Grantha script in Tamil Nadu may be divided into four periods. The archaic and ornamental, the transitional, the medieval, and the modern.
  - Archaic and ornamental variety is commonly known as Pallava Grantha. Mahendravarman's Tiruchirappalli rock cut cave and other cave temple inscriptions, Narasimhan's Mamallapuram, Kanchi Kailasanatha, and Saluvankuppam temple inscriptions, Mutharaiyar's Senthalai inscriptions are examples of this variety.
  - The transitional variety of Grantha inscriptions roughly belong to three centuries between 650 CE and 950 CE. Later Pallava's (Nandivarman's Kasakudi, Udayendram plates, etc.) and Pandyan Nedunjadaiyan's Anaimalai inscriptions are samples of this.
  - The medieval variety dates from about 950 CE to 1250 CE. Inscriptions of the imperial Cholas of Thanjavur are examples of this.
  - The modern variety belongs to the later Pandya's and Vijayanagarar periods.
- It was popular in Tamil Nadu until the early 20th century.

- After the introduction of printing machines, many Sanskrit books transcribed from palm leaves were printed in Grantha script.
- After Independence, the popularity of Hindi in Deva Nagari script influenced all printing works, and Grantha script went out of vogue.

## **2. Soda Lake**

- Scientists have discovered that a shallow "Soda Lake" in western Canada could be a good match for Darwin's "warm little ponds" where life got started on the primordial Earth.

About Soda Lake:

- It is a lake with a pH value usually between 9 and 11.
- High carbonate concentration, especially sodium carbonate, is responsible for the alkalinity of the water.
- It may also contain a high concentration of sodium chloride and other salts making it saline or hypersaline Lake.
- These are highly productive ecosystems compared to the freshwater lakes.
- These are the most productive aquatic environments on Earth because of the availability of dissolved carbon dioxide.
- They occur naturally in both arid and semi-arid areas.
- Geology and Genesis
  - Geological, climatic, and geographic requirements are required for a lake to become alkaline.
  - A topography that limits the outflow of water from the lake is needed.
  - An endorheic basin is formed when the water is confined without the outflow.
  - The pH of the water in the depression rises through the evaporation of the lake which requires a suitable climate like the desert climate to balance between the inflow and evaporation.
  - The rate at which carbonate salt dissolve in the lake water depends on the ecology of the surrounding area.
  - The relative absence of magnesium and calcium is critical in the formation of the soda lake since magnesium or calcium is likely to dissolve quickly and displace the carbonate ion thus neutralizing the pH of the lake water.
- Biodiversity
  - These are dominated by prokaryotes like bacteria and archaea, especially in lakes with higher levels of alkalinity.
  - Multicellular organisms such as brine shrimp and fish are found in plenty if not most of the soda lakes.
- Examples of Soda Lakes
  - Africa and Asia have the highest number of soda lakes since the two continents have vast desert conditions which are perfect for the formation of soda lakes.
  - Most of the soda lakes in Africa are located in Eastern Africa, especially in Kenya, Tanzania, and Ethiopia.
  - Lake Natron in Tanzania is one of the most outstanding soda lakes in Africa
  - India and China have the highest number of soda lakes in Asia.
  - Some of the soda lakes in Asia include Lake Van, Tso Kar Salt Lake, Pangong Salt Lake, and Lake Zabuye.

## **3. Disease X**

- Recently, the World Health Organisation (WHO) emphasized the urgent need for global preparedness against a potential new pandemic, referred to as 'Disease X'.

About Disease X:

- It is referred to as a hypothetical pathogen or threat that can cause a major pandemic in future.
- It could be a new agent, a virus, a bacterium, or a fungus without any known treatment.
- The term coined by scientists and the World Health Organization could be any of the 25 families of viruses that have the capability to cause illness in people.
- Disease X was included in the WHO's updated Blueprint list of diseases back in 2018.
- Scientists are of the opinion that Disease X could be 20 times more deadly than SARS-Covid virus that caused pandemic recently.
- It represents an illness which is currently unknown but could pose a serious microbial threat to humans in the future.

**4. Sapinda marriages**

- The Delhi High Court has affirmed the constitutional validity of a provision in the Hindu Marriage Act that prohibits ‘sapinda’ marriages, those between individuals related through ancestors unless their custom permits.

About Sapinda marriage:

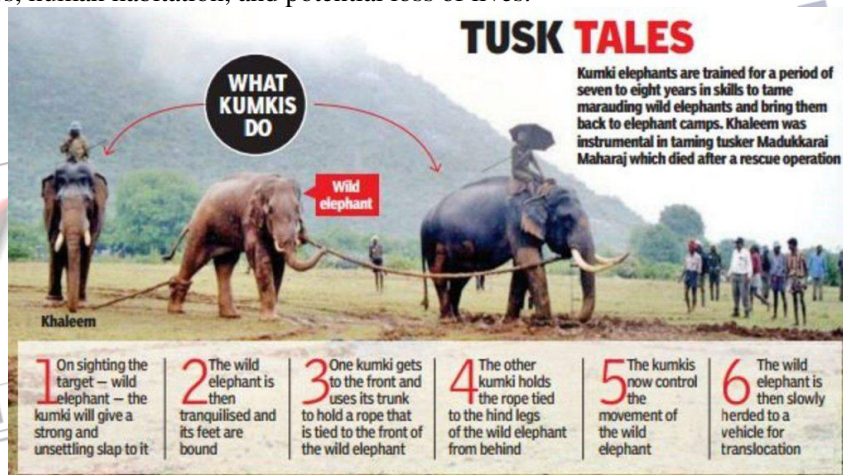
- Sapinda marriages refer to unions between individuals who are closely related through their common lineal ancestors.
- According to the Hindu Marriage Act, individuals are considered ‘sapindas’ if one is a direct ancestor of the other within specified limits or if they share a common lineal ascendant within the ‘sapinda’ relationship boundaries.
- The Act aims to regulate such unions to prevent potential issues and ensure adherence to recognized customs.
- Sapinda’ relationship extends up to the third generation through the mother’s line and the fifth generation through the father’s line.

**5. Kumki Elephant**

- To address the increasing human-elephant conflict in Odisha, the state government has requested four Kumki elephants and their mahouts from Tamil Nadu.

About Kumki Elephants:

- Kumki elephants are trained captive elephants used for operations such as trapping, rescuing, and tranquillizing wild elephants.
- The move aims to strategically deploy Kumki elephants in conflict-prone areas to reduce damage to crops, human habitation, and potential loss of lives.



**ANSWER WRITTING**

**Q. How would the evolution of Quantum computing impact the nation and society? Examine.**

Answer: Quantum computing is the use of quantum-mechanical phenomena such as superposition and entanglement to perform computation. A quantum computer is used to perform such computation, which can be implemented theoretically or physically. IBM has introduced Condor, the first quantum computer with over 1,000 qubits, emphasizing a new strategy focusing on error correction rather than increasing qubit quantity.

**Impacts of Quantum computing on the nation**

- Secure Communication:
  - China recently demonstrated secure quantum communication links between terrestrial stations and satellites.
  - This area is significant to satellites, military and cyber security among others as it promises unimaginably fast computing and safe, unhackable satellite communication to its users.
- Research:
  - It can help in solving some of the fundamental questions in physics related to gravity, black hole etc.
  - Similarly, the quantum initiative could give a big boost to the Genome India project, a collaborative effort of 20 institutions to enable new efficiencies in life sciences, agriculture and medicine.

- **Disaster Management:**
  - Tsunamis, drought, earthquakes and floods may become more predictable with quantum applications.
  - The collection of data regarding climate change can be streamlined in a better way through quantum technology. This in turn will have a profound impact on agriculture, food technology chains and the limiting of farmland wastage.
- **Pharmaceutical industry:**
  - India's interest in the pharmaceutical and healthcare industry is huge.
  - Quantum computing could reduce the time frame of the discovery of new molecules and related processes to a few days from the present 10-year slog that scientists put in.
  - For instance, tracking protein behaviour or even modelling new proteins with the help of quantum computers could be made easier and faster.
  - Tackling chronic diseases like cancer, Alzheimer's and heart ailments is a big possibility of the technology.
- **Augmenting Industrial revolution 4.0:**
  - Quantum computing is an integral part of Industrial revolution 4.0.
  - Success in it will help in Strategic initiatives aimed at leveraging other Industrial revolution 4.0 technologies like the Internet-of-Things, machine learning, robotics, and artificial intelligence across sectors will further help in laying the foundation of the Knowledge economy.

#### **India's efforts towards quantum computing**

- India is getting there slowly but steadily. In February 2022, a joint team of the DRDO and IIT-Delhi successfully demonstrated a QKD link between two cities in UP — Prayagraj and Vindhyachal.
- In 2019, the Centre declared quantum technology a “mission of national importance”.
- The Union Budget 2020-21 had proposed to spend Rs 8,000 crore on the newly launched National Mission on Quantum Technologies and Applications.
- The Army has collaborated with industry and academia to build secure communications and cryptography applications.
- In 2018, the Department of Science & Technology unveiled a programme called Quantum Enabled Science & Technology (QuEST) and committed to investing Rs. 80 crore over the next three years to accelerate research.
- In December 2021, the Indian Army, with support from the National Security Council Secretariat (NSCS) established the Quantum Lab at Military College of Telecommunication Engineering, Mhow to spearhead research and training in this key developing field.
- In 2021, Government also inaugurated C-DOT's Quantum Communication Lab and unveiled the indigenously developed Quantum Key Distribution (QKD) solution.

#### **Way forward**

- Both private funding and philanthropic funding should be attracted towards quantum computing. For example, Funds can be used to attract and retain high quality manpower and to build international networks.
- Connections with Indian industry from the start would help quantum technologies to become commercially successful.
- Investing manpower and retaining them as quality human resource is very mobile.
- Participate in development of global standards and requirements for quantum computers.
- Procurement from other nations: India must consider procuring the United States National Security Agency's (NSA) Suite B Cryptography Quantum-Resistant Suite as its official encryption mechanism.
- Emulating cryptographic standards: the Indian defence establishment can consider emulating the cryptographic standards set by the US's National Institute of Standards and Technology (NIST) which has developed a series of encryption tools to handle quantum computer attacks.
- Develop quantum-resistant systems: India should start implementing and developing capabilities in quantum-resistant communications, specifically for critical strategic sectors.
- Funding: government can fund and encourage existing open-source projects related to postquantum cryptography.

- Participating in the global initiative: India can participate in the Open Quantum Safe project — a global initiative started in 2016 for prototyping and integrating quantum-resistant cryptographic algorithms.
- Prioritising QKDs over long distances, especially connecting military outposts for sensitive communications, can be prioritised to ensure secure communications whilst protecting key intelligence from potential quantum cyberattacks.
- Diplomatic partnerships with other “techno-democracies” — countries with top technology sectors, advanced economies, and a commitment to liberal democracy — can help India pool resources and mitigate emerging quantum cyber threats.

**MCQs**

- With reference to the circumstances in Indian agriculture, the concept of “Conservation Agriculture” assumes significance. Which of the following fall under the Conservation Agriculture?
  - Avoiding the monoculture practices
  - Adopting minimum tillage.
  - Avoiding the cultivation of plantation crops
  - Using crop residues to cover soil surface
  - Adopting spatial and temporal crop sequencing/crop rotations
 Select the correct answer using the code given below:
 

(a) 1, 3 and 4	(b) 2, 3, 4 and 5
(c) <b>2, 4 and 5</b>	(d) 1, 2, 3 and 5
- Consider the following statements with reference to the Investment Forum for Advancing Climate Resilient Agrifood Systems:
  - It is a joint initiative of NITI Aayog, Ministry of Agriculture and Farmers’ Welfare, and Food and Agriculture Organization (FAO).
  - It will focus on small and marginal farmers.
 Which of the statements given above is/are correct?
 

(a) 1 only	(b) 2 only
(c) <b>Both 1 and 2</b>	(d) Neither 1 nor 2
- Which one of the statements is correct with respect to Total Expense Ratio (TER)?
  - It is a sales charge or fee that investors pay when purchasing shares of a mutual fund.
  - It is a fee charged by some mutual funds for distribution and marketing expenses.
  - These are the costs associated with buying and selling securities within the fund portfolio.
  - It is a financial metric that represents the total costs associated with managing and operating an investment fund.**
- Consider the following statement about the Ketu Kondh tribe:
  - They are Particularly Vulnerable Tribal Groups (PVTGs) from Odisha.
  - They follow Shifting cultivation called Podu Chaas.
 Which of the statements given above is/are correct?
 

(a) 1 only	(b) 2 only
(c) <b>Both 1 and 2</b>	(d) Neither 1 nor 2
- Consider the following statement about the Grantham Inscriptions:
  - Grantha is an important historical script that was once used to write Sanskrit throughout South East Asia and greater Tamil Nadu.
  - Both Grantha and Tamil scripts appear alike in modern forms and the evolution of both scripts from Brahmi was also more or less similar.
  - The development of the Grantha script in Tamil Nadu may be divided into three periods.
 Which of the statements given above is/are correct?
 

(a) <b>1 and 2 only</b>	(b) 2 and 3 only
(c) 1 and 3 only	(d) 1, 2 and 3
- Why is Lake Retba commonly referred to as the “Pink Lake”?
  - Presence of flamingos
  - Abundance of halophilic green algae**
  - High iron content in the water
  - Reflection of the surrounding landscape
- With reference to Wandering Albatross, consider the following statements:
  - It is the largest flying bird with a wingspan of 3.5 metres.
  - It is vulnerable as per IUCN Red list.
 Which of the statements given above is/are correct?
 

(a) 1 only	(b) 2 only
(c) <b>Both 1 and 2</b>	(d) Neither 1 nor 2
- D.K. Basu’s judgement, recently seen in the news, is related to which one of the following?
  - Protect the rights and dignity of individuals in police custody**
  - Protection of interests of minorities
  - Child Labour
  - Safeguards against sexual exploitation
- When is the theme of Republic Day 2024?
  - ‘Viksit Bharat’ (Developed India)
  - ‘Bharat- Loktantra ki Matruka’ (Bharat - The Mother of Democracy)
  - ‘Viksit Bharat’ (Developed India) and ‘Bharat- Loktantra ki Matruka’ (Bharat - The Mother of Democracy)**
  - Bharat and AI
- The term ‘Eyong’ recently mentioned in the news is related to which one of the following?
  - A traditional Manipuri loom.**
  - A community reserve in Arunachal.
  - A musical instrument of the Apatani Tribe.
  - Handmade paintings of a tribe in Nagaland.