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ONE NATION ONE SUBSCRIPTION: EMPOWERING INDIA'S RESEARCH ECOSYSTEM

In Context

- The **One Nation One Subscription (ONOS)** initiative is a landmark step aimed at democratizing access to global scholarly knowledge in India. It aligns with the **broader goals of NEP 2020 and ViksitBharat@2047**.

Implementation of ONOS

- Role of INFLIBNET:** The Information and Library Network Centre under UGC will centrally manage the subscription and distribution, ensuring seamless digital access to resources. A centralized platform will simplify access and reduce administrative burdens.

CABINET DECISION
25TH NOVEMBER, 2024

One Nation One Subscription

- Cabinet approves **One Nation One Subscription** - Central Sector Scheme for providing country-wide access to scholarly research articles and journal publication
- Scheme to be administered through a simple, user friendly and fully digital process
- Rs.6,000 crore** has been allocated for **One Nation One Subscription** for 3 calendar years viz **2025, 2026 and 2027**
- Benefits to be provided to all Higher Educational Institutions under the **Central or State Government** and **R&D Institutions of Central Government**

- Funding:** A ₹6,000 crore budget has been allocated for the **scheme's first phase (2025–2027)**.
- Phase I (2025–2027):** Establish the framework, provide access to research materials, and negotiate Article Processing Charges (APCs) for Indian researchers.

Benefits

- Democratization of Knowledge:** Provides equitable access to international research resources across tier-2 and tier-3 cities, addressing regional disparities in research opportunities.
- Boosts Research Quality:** Access to high-quality journals enhances research capabilities, enabling

Indian researchers to contribute to cutting-edge global innovations.

- Cost Efficiency:** Centralized funding reduces duplication of subscriptions by individual institutions, saving costs for HEIs and research centers.
- Discounts on Article Processing Charges (APCs) make publishing in high-impact journals more accessible.
- Fosters Collaboration:** Integration with global research communities promotes interdisciplinary and international collaborations, elevating India's global research footprint.
- Support for National Development:** Enhances India's R&D ecosystem, supporting innovation in critical areas like STEM, medicine, and social sciences, which are pivotal for economic growth and self-reliance.
- Improved Academic Infrastructure:** Complements initiatives like the Anusandhan National Research Foundation (ANRF), creating a more robust research infrastructure.

Challenges

- Administrative Complexity:** Coordinating access for 6,300 institutions with diverse needs may pose significant logistical and administrative challenges.
- Digital Divide:** Effective utilization of digital resources may be hindered by infrastructure gaps in tier-2 and tier-3 cities, such as unreliable internet connectivity or lack of digital literacy.
- Limited Scope:** The scheme covers only select international journals, and many researchers might still require access to resources not included in Phase I.
- Sustainability:** Long-term funding for such a large-scale initiative requires careful planning to ensure it remains viable without compromising quality.
- Monitoring and Evaluation:** Measuring the actual impact of the initiative on research output and innovation can be challenging.
- Dependency on Global Publishers:** Heavily relying on foreign publishers may limit India's leverage in negotiations and could lead to higher costs over time.

Way Ahead

- Strengthen Infrastructure:** Improve digital connectivity and provide training in digital resource usage for institutions in remote areas.

- **Phase Expansion:** Gradually expand ONOS to include more journals, databases, and even regional or Indian language resources to broaden access.
- **Promote Open Access:** Encourage Indian researchers to utilize Open Access (OA) platforms and build national repositories for sharing research outputs freely.
- **Enhance Negotiation Leverage:** Collaborate with other nations to negotiate better terms with publishers, including lower APCs and subscription costs.
- **Focus on Research Outputs:** Develop metrics to assess the impact of ONOS on research quality, innovation, and India's global rankings in R&D.
- **Support Regional Institutions:** Provide additional resources for smaller or less-resourced institutions to make full use of ONOS benefits.
- **Public Awareness and Training:** Launch awareness campaigns and workshops for researchers, faculty, and students on maximizing the use of ONOS resources.

QUAD RENEWS PLEDGE TOWARDS WORKING FOR FREE-STABLE INDO-PACIFIC

Context

- The Quad nations reaffirmed their commitment to a free, open, and stable Indo-Pacific region in a joint statement commemorating 20 years of Quad cooperation.

Highlights of the Joint Statement

- The Quad reiterated its unwavering support for the centrality and unity of the **Association of Southeast Asian Nations (ASEAN)**.
 - ♦ The members endorsed the implementation of the **ASEAN Outlook on the Indo-Pacific (AOIP)** as a framework for regional cooperation.
- **Humanitarian Assistance and Disaster Relief (HADR):** The members emphasized their ongoing efforts in 2024 to support disaster preparedness and provide rapid, life-saving relief during crises across the Indo-Pacific region.

Quadrilateral Security Dialogue (QUAD)

- It is an **informal multilateral grouping** of **India, the U.S., Australia, and Japan** aimed at cooperation for a free and open Indo-Pacific region.
- **Origin:** The Quad began as a loose partnership after the **2004 Indian Ocean tsunami** when the four

countries joined together to provide humanitarian and disaster assistance to the affected region.

- ♦ It was formalized by former Japanese Prime Minister **Shinzo Abe in 2007**, but then fell dormant.
- After a decade it was **resurrected in 2017**, reflecting changing attitudes in the region toward China's growing influence.

Strategic Significance of Quad

- **Act East policy:** India's participation in the Quad emphasizing deeper engagement with East Asian nations and strengthening maritime security cooperation.
- **Military cooperation:** It provides a platform for military cooperation, intelligence sharing, and joint exercises aimed at maintaining maritime security and ensuring the rule of law.
- **Counterbalancing China's Influence:** QUAD is crucial for India's interests in safeguarding its maritime trade routes and ensuring freedom of navigation in international waters.
- India has supported a **rule-based multipolar world** and QUAD can help it in achieving its ambition of becoming a regional superpower.

Challenges Faced by the Quad

- **Divergent Priorities:** Each Quad nation has unique geopolitical and economic interests, leading to differences in prioritizing specific issues, such as trade, military cooperation, or climate change.
- **Quad perception of an anti-China alliance** complicates relations with other nations in the Indo-Pacific that have significant economic ties with China.
- **Quad lacks a formal structure** or secretariat, making long-term planning and implementation of initiatives challenging.
- **Navigating Regional Dynamics:** ASEAN nations have expressed concerns about the Quad overshadowing their centrality in Indo-Pacific security architecture.

Way Ahead

- With **India** set to host the **Quad Summit in 2025**, the group's renewed commitment and initiatives reflect its vision of an inclusive, prosperous, and stable Indo-Pacific.
- Further clear communication about Quad's objectives are necessary to address concerns regarding its anti-China perception and ensure broader acceptance in the Indo-Pacific.

- Strengthening cooperation in emerging technologies, infrastructure, and climate resilience can help diversify Quad's agenda.

INDIA'S LEGAL REFORMS IN 2024

In News

- In 2024, significant reforms were introduced to modernize India's legal framework and align it with global standards.

Major Legal Reforms in 2024

- **Criminal Justice System: New Bharatiya Criminal Laws** replaced outdated laws like the Indian Penal Code, including the abolition of the sedition law.
 - ♦ **Bharatiya Nyaya Sanhita** replaced the **Indian Penal Code**, eliminating obsolete provisions such as sedition.
 - ♦ **Bharatiya Sakshya Adhinyam** replaced the **Indian Evidence Act**, updating provisions to include modern methods of handling evidence, especially electronic evidence.
 - ♦ **Bharatiya Nagarik Suraksha Sanhita** replaced the Code of Criminal Procedure, introducing reforms in police custody and suspect handling procedures.
- **The Vayuyan Vidheyak Bill** replaced the Aircraft Act of 1934.
 - ♦ The Bill empowers the Central Government to make rules for any aircraft or class of aircraft, and for securing the safety of aircraft operations. It is aimed to empower the government to make rules for the investigation of any air accident or incident.
- **Carriage of Goods by Sea Bill** replaced the century-old Carriage of Goods by Sea Act of 1925.
 - ♦ It seeks to comply with the international convention and with the changing global scenario in the shipping industry. The provisions will be applicable to outward cargo, that is, ships carrying goods from Indian port to any other port, whether in or outside India.
- **Waqf Reforms:**
 - ♦ **Waqf (Amendment) Bill, 2024** streamlined the Waqf Board's functioning.
 - ♦ **Mussalman Wakf (Repeal) Bill, 2024** aimed at improving the management of Waqf properties.
- **Railway Reforms: Railway (Amendment) Bill 2024** aimed at improving railway operational efficiency and granting autonomy to railway zones.

- **Banking Reforms:** Banking Laws (Amendment) Bill focused on improving customer convenience and investor protection.
- **Simultaneous Elections: Constitution (One Hundred and Twenty-Ninth) Amendment Bill** introduced to facilitate simultaneous elections to the Lok Sabha and State Assemblies.
 - ♦ The **Union Territories Laws (Amendment) Bill** supported the same objective of simultaneous elections.
- **Prime Minister's Initiative:** Prime Minister Narendra Modi has been focused on eliminating colonial-era laws and modernizing India's legal framework since his tenure as Gujarat Chief Minister and continued this mission after becoming Prime Minister in 2014.
 - ♦ Over 1500 archaic laws have been scrapped, improving people's lives.

Significance and Need in Present Scenario

- India's legal reforms in 2024 represent a significant step in modernizing its legal system. By replacing colonial-era laws and introducing progressive legislation, the government aims to align the legal framework with contemporary needs.
- These reforms are poised to transform sectors like justice, governance, railways, banking, and religious institutions, improving citizens' lives and enhancing India's global competitiveness.

RBI'S FINANCIAL STABILITY REPORT FLAGS RISING NPAS, GLOBAL ECONOMIC RISKS

Context

- Recently, the Reserve Bank of India (RBI) released its **Financial Stability Report (FSR), December 2024** highlighting several critical aspects of the Indian and global financial landscapes.
 - ♦ **Financial Stability Report (FSR)** is published by RBI bi-annually on behalf of the **Financial Stability and Development Council (FSDC)**.

Key Highlights of the Report

- **Stress Tests and Resilience:** Macro stress tests conducted by the RBI demonstrate that most SCBs have sufficient capital buffers to withstand adverse scenarios.
 - ♦ The resilience of mutual funds, clearing corporations, and non-banking financial companies (NBFCs) is also validated through these tests.

- **Government Finance:** The central government's **debt-to-GDP ratio** is expected to decrease from 62.7% in 2020-21 to 56.8% by 2024-25.
 - ♦ Similarly, states' outstanding liabilities are projected to decline from 31% to 28.8%.
- **Economic Growth Projections:** The report projects that the Indian economy will expand by **6.6% in FY25 (2024-25)**, driven by a **revival in rural consumption, increased government spending, and strong services exports**.
- **Rising Non-Performing Assets (NPAs):** The report indicates a potential rise in the share of bad loans among commercial banks.
 - ♦ Under baseline stress scenarios, the **Gross Non-performing Asset (GNPA) ratio** could increase from 2.6% in September 2024 to 3% by March 2026.
- **Domestic Financial Stability:** Despite global uncertainties, the Indian financial system remains robust.
 - ♦ The soundness of Scheduled Commercial Banks (SCBs) is supported by strong profitability, and adequate capital and liquidity buffers.
 - ♦ The **return on assets (RoA) and return on equity (RoE)** for banks are at decadal highs.
- **Sectoral Insights:** The FSR highlights concerns in specific sectors, such as **microfinance and consumer credit**, which require close monitoring.
- **Insurance Sector:** It maintains a **robust solvency ratio**, indicating its stability.

Key Concerns Highlighted in the FSR of RBI

- **High Public Debt:** Although the Union government's debt-to-GDP ratio is expected to decrease from its pandemic peak, it remains a concern for long-term fiscal sustainability.
- **Global Economic Vulnerabilities:** These include *stretched asset valuations, high public debt, prolonged geopolitical conflicts, and emerging technological risks*.
 - ♦ These factors pose medium-term risks to global financial stability.
- **Geopolitical Conflicts:** Prolonged geopolitical conflicts can disrupt global supply chains, affect commodity prices, and lead to financial market volatility, all of which can have adverse effects on the Indian economy.
- **Emerging Technological Risks:** Cybersecurity threats, data privacy issues, and the potential for

technological disruptions in financial services are highlighted as areas requiring close monitoring and robust regulatory frameworks.

- **Climate Change:** Extreme weather events and the transition to a low-carbon economy could have significant implications for financial institutions and the broader economy.

Financial Stability and Development Council (FSDC)

- **Established:** In 2010 as a **non-statutory** apex-level body by the Government of India.
- **Aim:** Strengthening and institutionalizing the mechanism for maintaining financial stability and promoting financial sector development.
- **Members:** Union Finance Minister (Chairperson)
 - ♦ Heads of Financial Sector Regulators (RBI, SEBI, PFRDA, IRDA & FMC); Finance Secretary and Chief Economic Adviser etc.
 - ♦ It can invite experts to its meeting if required.
- **Functions:** Monitors and addresses systemic risks in the financial sector.
 - ♦ Enhances the growth and efficiency of the financial sector.
 - ♦ Facilitates coordination among financial sector regulators to resolve inter-regulatory issues.
 - ♦ Strengthens mechanisms for dealing with financial crises.

NEED FOR MASTERING FRONTIER TECHNOLOGIES IN DEFENCE

Context

- Defence Minister of India, Rajnath Singh, addressing officers at the Army War College (AWC), Mhow, highlighted the significance of mastering frontier technologies in today's dynamic world.

What are Frontier technologies?

- Frontier technologies are **cutting-edge, transformative innovations** at the forefront of technological development.
- They involve a **high degree of innovation** and are characterized by their ability to disrupt traditional processes, improve efficiency, and solve complex challenges.

Radical Changes in Warfare

- **Unconventional Warfare:** The shift from conventional to hybrid warfare integrates traditional and non-traditional tactics.
 - ♦ Unconventional strategies focus on asymmetric methods such as proxy wars and guerrilla operations.
- **Information Warfare:** It involves the use of misinformation, disinformation, and psychological tactics to manipulate public perception and decision-making.
- **Artificial Intelligence (AI) Warfare:** AI-based technologies enable autonomous weapons and predictive analytics for strategic decision-making.
- **Electromagnetic and Space Warfare:** It disrupts enemy communication and radar systems through **electromagnetic pulses (EMPs)**.
 - ♦ Space warfare involves securing satellite infrastructure crucial for communication and surveillance.
- **Cyber Attacks:** It targets critical infrastructure such as defense, energy, and banking systems.

Role of Military Training Centers

- **Skill Development in Frontier Technologies:** Training soldiers in AI, robotics, quantum computing, and cybersecurity.
- **Research and Development:** Collaboration with defense research institutions to innovate cutting-edge technologies.
- **Integrated Warfare Training:** Cross-domain integration of land, sea, air, and space warfare strategies.

Government initiatives

- Government schemes such as **iDEX (Innovations for Defence Excellence)** and **DTIS (Defence Testing Infrastructure Scheme)** to enable innovation within the Defence & Aerospace ecosystem.
- **Technology Development Fund (TDF)** aims to promote the development of indigenous technologies to meet the requirements of the armed forces.
 - ♦ It supports research and development (R&D) activities in areas critical to defense.
- **Defence Innovation Organisation (DIO)** aims to foster collaboration between the government, private industry, and academia to boost innovation in defense technologies.

Challenges

- **Technological Lag** as there is dependency on foreign technology due to insufficient indigenous development.

- **Cyber Vulnerabilities:** There is risk of cyber breaches in critical defense systems.
- **Resource Constraints** due to limited budget allocation for R&D and training in frontier technologies.

Way Ahead

- **Global Collaborations:** Engaging in technology-sharing agreements and joint training programs with allied nations will ensure that India has access to the latest military innovations and operational tactics.
- **Ethical Use:** A robust legal and governance framework is essential to ensure that the use of advanced technologies in warfare is both secure and ethical.
- **Indigenization of Technology:** India needs to strengthen initiatives like 'Make in India' to foster domestic innovation and manufacturing capabilities.

NEWS IN SHORT

DIGITAL MAHA KUMBH

Context

- The Maha Kumbh 2025, set to take place in Prayagraj, Uttar Pradesh, promises to be a unique fusion of spirituality and cutting-edge technology.

Cyber Security at Maha Kumbh

- Deployment of **56 dedicated cyber warriors** and experts for cyber patrolling.
- Establishment of a **Maha Kumbh cyber police station** to counter cyber threats.
- **40 Variable Messaging Displays (VMDs)** will be installed in both the fair area and the commissionerates for raising awareness about cyber threats.

Infrastructure and Land Digitalization

- **A new district, Maha Kumbh Nagar,** is being developed with state-of-the-art digital infrastructure.
- **Drone surveys** before and after the monsoon will map land topography accurately.
- **GIS-based maps on Google Maps** will provide real-time navigation of essential public utilities.

Enhanced Devotee Security

- **Remote-controlled life buoys** will be deployed to quickly respond to emergencies and ensure the safety of pilgrims in water.

- **Underwater drones**, capable of diving up to 100 meters, will monitor activities beneath the waters, transmitting real-time reports to the **Integrated Command and Control Center (ICCC)**.

Key Facts About Kumbh

Aspect	Key Facts About Kumbh Mela
About	Largest peaceful congregation of pilgrims globally, involving bathing in sacred rivers for purification.
Locations	1. Haridwar: On the Ganges. 2. Ujjain: On the Shipra. 3. Nashik: On the Godavari (Dakshin Ganga). 4. Prayagraj: At the confluence of the Ganges, Yamuna, and Saraswati.
Types of Kumbh Mela	1. Main Kumbh Mela: Celebrated at four locations every 12 years. 2. Ardh-Kumbh Mela: Held every 6 years at Haridwar and Prayagraj. 3. Maha Kumbh Mela: Held every 144 years at Prayagraj. 4. Maagh Kumbh: Celebrated annually in Prayagraj during January-February.
Historical Evolution	1. Mythological Origins: Rooted in the Puranas, describing the battle for the Amrit pitcher. 2. Ancient Period: Prominent during Maurya and Gupta periods; gained prominence under Gupta rulers. 3. Medieval Period: Harshavardhana organized Kumbh at Prayagraj; Akbar honored Naga Sadhus. 4. Colonial Period: Documented by British administrators like James Prinsep. 5. Post-Independence: Recognized by UNESCO in 2017 as an intangible cultural heritage.
Guinness World Records	1. Largest Traffic and Crowd Management Plan. 2. Biggest Painting Exercise under the Paint My City Scheme. 3. Largest Sanitation and Waste Disposal Mechanism.
Cultural Significance	Symbolizes spiritual ethos, cultural unity, and India's capacity to host large-scale global events.

TRINIDAD AND TOBAGO

In News

- Trinidad and Tobago has declared a state of emergency due to a surge in violence, including gang-related shootings.

About Trinidad and Tobago

- **Capital:** Port of Spain
- **Location:** Southernmost Caribbean island nation, situated:
 - ♦ northeast of Venezuela
 - ♦ south of Grenada
 - ♦ In the Atlantic Ocean
- **Geographic Features:**
- **Rivers:** Ortoire River, Caroni River, Nariva River
- **Mountains:** Northern Range (Trinidad)
 - ♦ **Highest Peak:** El Cerro del Aripo (940 meters)

DR. PIERRE-SYLVAIN FILLIOZAT

In Context

- French-Indian Sanskrit Scholar and Padma Shri awardee, Dr. Pierre-Sylvain Filliozat passed away.

Key Contributions

- **Sanskrit and Indian Literature:** Dr. Filliozat is known for his expertise in classical Sanskrit and his interpretations of ancient texts.
- **South Indian Architecture:** He has conducted detailed studies on the art and architecture of South Indian temples.
- **Publications:** He has authored books and scholarly articles in French, English, and other languages on Indian philosophy, literature, and art.

SEMBANAD LAKE

Context

- The Alappuzha district administration in Kerala undertook a mega plastic cleaning drive as part of the **Vembanad Lake Rejuvenation Project**.

About Vembanad Lake

- **Name & Location:** Locally known as **Vembanad Kayal**, it is the longest lake in India and the largest lake in Kerala (covering the districts of Alappuzha, Kottayam, and Ernakulam).
- **Recognition:** Declared a Ramsar site in 2002, signifying its global importance as a wetland.
- **Rivers and Sea:** Formed from **four rivers** – the Meenachil, Achankovil, Pampa, and Manimala, the lake also has an outlet to the **Arabian Sea** in the west.
 - ♦ It serves as a major source of **freshwater** for the state but also has brackish water areas.
- **Snake Boat Race:** It is a hub of backwater tourism in the state and hosts the renowned **Nehru Trophy Boat Race**, popularly known as the Snake Boat Race, in one of its sections.

TOBACCO BOARD OF INDIA

In Context

- The Tobacco Board has undertaken several strategic initiatives to ensure the sustainability and growth of the tobacco industry.

Key Initiatives

- **Crop Planning and Production Regulation:** Aligns production with domestic and export demands.
- **Support for Farmers:** Provides handholding assistance for producing high-quality tobacco.
- **Promotion of Exports:** Carries out export promotion activities to sustain and improve tobacco exports. Leverages an IT-enabled electronic auctioning system for better price discovery and transparency.

Brief about India's Tobacco Industry

- **2nd Largest Producer of tobacco** globally, after China.
- **4th Largest Producer of FCV Tobacco (Flue-Cured Virginia)** after China, Brazil, and Zimbabwe.
- **2nd Largest Exporter of unmanufactured tobacco** (in quantity) after Brazil.
- **Contributed Rs.12,005.89 crore** to the Indian exchequer through exports in 2023-24.

About Tobacco Board of India

- **Statutory Body:** Established under the Tobacco Board Act, 1975 (Act 4 of 1975).
- **Ministry:** Ministry of Commerce & Industry.
- **Functions:** Enhances the export of tobacco varieties, especially Flue-Cured Virginia (FCV) tobacco.
 - ♦ Manages FCV tobacco production and distribution to meet domestic and export demands.
 - ♦ Maintains quality standards and supports farmers in meeting export requirements.

NEUTRINOS (GHOST PARTICLES)

Context

- Scientists are using two telescopes, part of the **Cubic Kilometre Neutrino Telescope (KM3NeT)**, to detect high-energy neutrinos, beneath the Mediterranean Sea.

What are Neutrinos?

- Neutrinos, discovered in **1959**, are tiny, **electrically neutral** subatomic particles, similar to electrons.
- They are the **second most abundant particles** in the universe after photons.
 - ♦ They rarely interact with matter, earning them the nickname "**ghost particles.**"
- Neutrinos pass through vast amounts of matter, with billions passing through a cubic centimeter of space every second.

Challenges in Detection

- Neutrinos are extremely difficult to detect due to their minimal interactions with matter.
- Only a few neutrino interactions are detected even in large detectors.

Cubic Kilometre Neutrino Telescope (KM3NeT) KM3NeT

- The KM3NeT is an **underwater neutrino telescope** deployed under the Mediterranean Sea.
- It **aims** to detect high-energy neutrinos by observing flashes of **Cherenkov radiation** (light produced when neutrinos interact with water or ice molecules).
- The dark, transparent depths of the sea provide ideal conditions for detecting these interactions, as they allow for the detection of Cherenkov radiation.

BELLY-LANDING

In News

- The tragic crash of **Jeju Air flight 7C2216 at Muan International Airport**, South Korea, raises critical questions about the possibility of Belly-Landing.

What is Belly-Landing?

- A **belly landing**, also sometimes called a **gear-up landing**, happens when a plane lands without its landing gear extended. This means the plane's underside, or fuselage, makes contact with the runway instead of the wheels.
- Belly-landings are rare and **typically used in emergencies** when:
 - ♦ The landing gear fails to deploy.
 - ♦ Pilots opt for it due to safer stopping options without wheels.
- **Risks of Belly-Landing:**
 - ♦ Increased friction generates sparks, potentially causing fire.
 - ♦ Wings being close to the ground require precise alignment; any tilt could result in catastrophic damage.

GOOGLE WILLOW CHIP

In News

- Google launched its latest quantum processor named 'Willow,' which created significant achievement in the potential of quantum computers to tackle practical problems.

About Willow

- Willow has **105 physical qubits** and operates at extremely low temperatures.
- It boasts better error correction and faster performance than other quantum computers.
- Operates at **near absolute zero temperatures (-273.15° C)** for maximum stability.
- The coherence time of Willow's data qubits is about 100 microseconds, improved by error correction protocols.
- Willow's architecture allows for lower error rates with more qubits.
- Google tested Willow using **Random Circuit Sampling (RCS)**, a computationally hard task, which Willow completed in a few minutes, outperforming classical computers by a massive margin.

Do you know?

- **Classical computers** use bits (0s and 1s) to process information.
- **Quantum computers** use qubits, which can represent both 0 and 1 simultaneously through quantum superposition, making them more powerful.
 - ◆ Qubits are fragile and prone to errors, unlike robust classical bits.
 - ◆ Methods like error-correction protocols are needed to identify and fix these errors.
- **Surface Code Method** arranges qubits on a grid, using data qubits and measurement qubits to detect and correct errors without violating quantum principles like the no-cloning theorem.

NEW GLENN ROCKET**Context**

- The Federal Aviation Administration (FAA) has granted Blue Origin a commercial space launch license for its New Glenn rocket.

What is the New Glenn rocket?

- New Glenn is a **heavy-lift, two-stage rocket** developed by Blue Origin.
 - ◆ It is named after **John Glenn**, the first American to orbit Earth.
- The rocket stands at 320 feet, and has a 7-meter-wide payload fairing.

- **The first stage** of the rocket is **reusable and powered by seven BE-4 engines**, which are **LNG-fueled** and produce over 3.8 million pounds of thrust.
- **The second stage** is powered by two BE-3U engines, using **liquid hydrogen** and oxygen, generating over 320,000 pounds of vacuum thrust.

INDIA'S FIRST GLASS BRIDGE OVER SEA**In News**

- The Tamil Nadu CM inaugurated **India's first glass bridge over the sea**.

About bridge

- It connects the Tiruvalluvar Statue and Vivekananda Rock Memorial in Kanniyakumari.
- The inauguration was part of the 25th anniversary celebrations of the Tiruvalluvar Statue.
 - ◆ The statue is officially named the "**Statue of Wisdom**."
 - ◆ It represents the 133 chapters of Tirukkural.
- **Bridge Features:** The 77-meter-long, 10-meter-wide bridge allows safe passage between the two landmarks while providing views of the sea below.
 - ◆ The glass bridge was built to address issues faced by ferries, which are often unable to dock near the Tiruvalluvar Statue due to rough seas and low tides.

