1. **Quantum Sensing:** NASA's Jet Propulsion Laboratory, along with private firms and academic institutions, is developing the **first space-based quantum sensor** to measure **gravity**.
   - **About Quantum Sensing:** It is an advanced sensor technology that improves accuracy in measuring, navigating, exploring, and detecting changes in motion, electric and magnetic fields.
     - Works by extracting data from individual atoms, unlike classical physics which relies on large atomic collections.
     - Offers exponentially greater accuracy, efficiency, and productivity.
     - Not affected by physical constraints, signal jamming, or electromagnetic interference like conventional sensors.
   - **Uses of Quantum Sensing:**
     - **Geolocation:** Faster, more accurate, reliable alternative to GPS with fewer limitations.
     - **Medical imaging:** Provides clearer, cheaper, and safer diagnostic images.
     - **Autonomous navigation:** Enables safe vehicle movement in complex or crowded areas.
     - **Guidance systems:** More accurate and resilient in space, underwater, and RF-heavy environments.
     - **Underground mapping:** Detects and maps tunnels, ruins, mines, and pipelines.
     - **Disaster prediction:** Senses gravitational and tectonic shifts to predict natural disasters like earthquakes and tsunamis.
2. **AI Careers for Women:** Ministry of Skill Development and Entrepreneurship (MSDE) and Microsoft have launched 'AI Careers for Women', establishing 30 Centres of Excellence (CoEs) in women's colleges across six states, focusing on AI skilling in Tier-II and Tier-III towns.
   - **About AI Careers for Women:**
     - **Objective:** Empower women in higher education to pursue careers in Artificial Intelligence (AI) and bridge the gender gap in tech.
     - **Curriculum:** Microsoft to provide 240-hour training, developed with NCVET, aligned to industry standards.
     - **Model:** Training to follow hub and spoke model – 30 CoEs (hubs) and 150 institutions (spokes) in six states.
     - **Policy Alignment:** Program aligned with the National Education Policy (NEP) and integrated with credit-linked university curricula.

- **Implementation:** Edunet Foundation to execute the program in collaboration with academic institutions and industry partners.
- **Coverage:** Aims to train 20,000 women learners through structured training, hands-on projects, and real-world applications.
- **Opportunities:** Provides access to AI certifications, internships, apprenticeships, fellowships, career guidance, and job roles.
- **Rural Impact:** Enables rural women to become AI developers, work on AI applications and datasets, and drive AI innovation.
- **Workforce Participation:** Designed to increase women's participation in the digital workforce and promote inclusive economic growth.

3. **Section 69 of the Bharatiya Nyaya Sanhita (BNS), 2023:** The Section has introduced a new stand-alone offence for sexual intercourse on false promise of marriage, with lesser punishment than rape under **Section 63 BNS**.

- **About Section 69 of the BNS:** It addresses cases involving sexual intercourse by deceitful means or false promise to marry, not amounting to rape.
  - **No Change in Rape Definition:** Section 69 was introduced without any change to the definition of rape or consent under Section 63 and Section 28 of the BNS.
  - **Punishment Reduced:** The section has reduced punishment compared to rape under Section 63 BNS or Section 375 of IPC.
  - **Covered Under "Misconception of Fact":** Consent obtained under false promise of marriage is already covered under "misconception of fact" in Section 28 BNS, and hence qualifies as rape under Section 63.
  - **Overlap with Rape Law:** Since such cases already fall under the ambit of rape, introducing Section 69 as a separate offence of lesser gravity makes it redundant.
- **Court Limitations on Misuse:**
  - **Anurag Soni v. State of Chhattisgarh (2019):** SC held that unless false promise existed from the start, it is not rape.
  - **Rajnish Singh @ Soni v. State of U.P. (2025):** A 15-year consensual relationship was held not rape, as the woman portrayed herself as wife.

4. **M2M SIMs & Communications:** Telecom Regulatory Authority of India (TRAI) has released recommendations on 'the Issues Related to Critical Services in the M2M Sector, and Transfer of Ownership of M2M SIMs' in response to a reference from the Department of Telecommunications (DoT).
   - **About M2M SIMs & Communications:** It enables services across sectors such as automotive, utilities, healthcare, public safety, smart city, and agriculture.
     - M2M Ecosystem is at an early growth stage; as it matures, critical IoT services requiring ultra-reliable, low-latency, high-availability connectivity will expand.
     - **Classification Process:** Ministries/Regulators should classify critical IoT services in consultation with the DoT.
     - **Institutional Mechanism:** DoT should devise an institutional mechanism to assist ministries/regulatory bodies in classifying services.
     - **Technology-Agnostic Approach:** TRAI recommended that any M2M technology (wired/wireless, licensed/unlicensed spectrum) may be used if service benchmarks are met.
     - **Security & Privacy:** TRAI recommended that M2M communication modules in IoT devices used in critical sectors (as identified by NCIIPC) should be covered under MTCTE in a phased manner.
   - **About Telecom Regulatory Authority of India (TRAI):** Formed under the Telecom Regulatory Authority of India Act, 1997 passed by Parliament.
     - **Purpose:** To regulate telecom services, including the fixation/revision of tariffs—functions previously handled by the Central Government.
     - **Functions:** Responsible for framing regulations, guidelines, and policies related to tariffs, quality of service, and spectrum allocation in the telecom sector.
5. **Alamosaurus:** Geology students recently discovered a rare, nearly complete fossil of Alamosaurus at Big Bend National Park, United States.
   - **About:** Alamosaurus is one of the largest dinosaurs ever known.
     - Lived during the Late Cretaceous period (100.5 to 66 million years ago).
     - Herbivorous sauropod with armoured spikes on its back for protection against predators.
     - Belonged to sauropods, the largest land animals to ever evolve.

- Only known sauropod in North America from the Upper Cretaceous.
- Largest terrestrial animal in North America during the Upper Cretaceous.
- Rivalled in size with South America's Argentinosaurus (lived 97–92 million years ago).
- Had a long neck, tail, and pillar-like limbs typical of sauropods.
- Went extinct in the Cretaceous–Paleogene extinction event; among the last non-avian dinosaurs.



6. **Strait of Gibraltar:** Sayoni Das, a Bengal swimmer, recently became the first Asian woman to successfully cross the Strait of Gibraltar.
   - **About Strait of Gibraltar:** Separates Europe and Africa, connecting the Mediterranean Sea to the Atlantic Ocean.
   - **Bordering countries:** Spain and British Overseas Territory of Gibraltar (north); Morocco and Spanish enclave Ceuta (south).
   - **Pillars:** Rock of Gibraltar and Mount Hacho/Jebel Moussa mark the strait's eastern end.
   - **Depth:** Ranges from 300 to 900 meters; lies between Spain's high plateau and Atlas Mountains of North Africa.
   - **Formation:** Resulted from the northward movement of the African Plate towards the European Plate.
   - **Water flow:** Atlantic Ocean (less saline) flows inward and above. Mediterranean Sea (highly saline) flows outward and beneath.
   - **Significance:** Only natural link between the Atlantic Ocean and the Mediterranean Sea. One of the busiest waterways in the world.
   - **Important port:** Moroccan port of Tanger-Med, near Tangier.

7. **Bullseye Galaxy:** An international research team using the Hubble Space Telescope and W.M. Keck Observatory recently discovered the Bullseye Galaxy (LEDA 1313424).



   - **About Bullseye Galaxy (LEDA 1313424):** It is a collisional ring galaxy (CRG) located 534 million light-years away in the constellation Pisces.
     - Formed around 50 million years ago due to a head-on collision with a blue dwarf galaxy.
     - The collision created rippling gas waves, triggering ring-shaped star formation.
     - **Rare structure:** Most ring galaxies have 2–3 rings; this one has 9 rings.
   - **Telescopic confirmation:**
     - Hubble Space Telescope: Identified 8 rings.
     - Keck Observatory (Hawaii): Confirmed a 9th ring.
     - Size: Diameter- ~250,000 light-years (2.5× the Milky Way).
     - A thin gas trail still links it to the dwarf galaxy, despite 130,000 light-years separation.
     - **Future evolution:** May become a Giant Low Surface Brightness (GLSB) Galaxy.
   - **About Giant Low Surface Brightness (GLSB) Galaxies:** It is a rare, massive galaxies with diffuse, low-density stellar disks, contain large amounts of neutral hydrogen but have low star formation rates.

8. **SpaDeX Mission:** ISRO has recently successfully completed the second docking of its two satellites — SDX01 (Chaser) and SDX02 (Target) — under the SpaDeX (Space Docking Experiment) mission.
   - **About SpaDeX Mission:** SpaDeX stands for Space Docking Experiment developed by ISRO.
     - It is a technology demonstration mission to test docking and undocking capabilities of two satellites in low-Earth orbit.
     - **Involves two small satellites:** SDX01 (Chaser) & SDX02 (Target). Each satellite weighs around 220 kg. Launched by PSLV-C60 into a 460 km circular orbit with a 45° inclination.
   - **Objectives of SpaDeX:**
     - **Primary Objective:** Demonstrate rendezvous, docking, and undocking of spacecraft in orbit.
     - **Secondary Objectives:** Demonstrate electric power transfer between docked satellites.
     - **Significance:** With this success, India becomes the fourth country after the USA, Russia, and China to achieve satellite docking operations.