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1. The Nobel Prize in Medicine for this year was announced in Stockholm, the capital of Sweden.

- According to the announcement by Thomas Perlmann, Secretary of the Nobel Committee, the award will be shared by three scientists:
    - Karl Deisseroth (54): Professor at Stanford University in California, USA.
    - Peter Hegemann (71): Senior Professor at Humboldt University in Berlin, the capital of Germany.
    - Georg Nagel (73): Professor at the University of Würzburg in Germany.

(ii) Research on Optogenetics

- The Nobel Prize has been awarded to the three scientists for their research on optogenetics, a technique that explains how light can be used to study and control the activity of nerve cells in the brain, which shape memories, emotions and behaviour.
- The prize money of 12 million Swedish kronor (approximately ₹11.50 crore) will be shared among the three laureates.

(iii) Significance of the Research

- In a post on X, the Nobel Assembly, which selects the laureates, praised the achievement, stating that optogenetics is now being used in laboratories around the world to unravel the mysteries of the brain.

(iv) History of the Nobel Prize

- The Nobel Prize has been awarded since 1901 in accordance with the will of Alfred Nobel, a Swedish scientist and inventor of dynamite.
- The Nobel Prizes are awarded annually in the following fields:
    - Medicine

- Physics
- Chemistry
- Literature
- Peace
- Economic Sciences

2. No candidate secured more than 50% of the votes required to win the Presidential election in Brazil, a South American country. Therefore, a second-round election will be held on the 25th.

(i) Main Contestants

- A total of 12 candidates contested the election.
- The main contest was between the following two candidates:
  - Luiz Inácio Lula da Silva (80): The veteran leader, contesting for the Presidency for the fourth time.
  - Flávio Bolsonaro (45): A senator and son of former President Jair Bolsonaro, who was sentenced to 27 years in prison in a case related to an attempted coup.

(ii) Voter Participation and Results

- Approximately 15.9 crore (159 million) voters were eligible to vote.
- Elections for Governors and members of Parliament were also held simultaneously.
- According to the vote count:
  - Flávio Bolsonaro: 47% of the votes, holding a narrow lead.
  - Luiz Inácio Lula da Silva: 45% of the votes.
- However, neither candidate secured more than 50% of the votes required to win in the first round.

(iii) Second-Round Election and Term of Office

- Following the first-round results, Brazil's Electoral Court officially announced that

the second and final round of the Presidential election between Flávio Bolsonaro and Luiz Inácio Lula da Silva would be held on the 25th.

- The term of office of the newly elected President will begin on 5 January 2027.

3. New bilateral action plan to further attract investment

(i) New Bilateral Investment Treaty (BIT) Framework

- Union Finance Minister Nirmala Sitharaman announced that the Union Cabinet will soon approve a new Bilateral Investment Treaty (BIT) framework aimed at attracting greater foreign investment into India. The new framework has been under development for approximately 1.5 years.
- It is designed to rectify deficiencies in the existing investment framework while providing enhanced security and protection to investors from both participating nations.
- The Finance Minister highlighted these updates during her address at the Munich Security Conference held in Delhi.

(ii) International Treaties & Ongoing Negotiations

- Sitharaman noted that the recent investment agreement with Saudi Arabia is significantly improved compared to the 2016 framework, placing stronger emphasis on protecting investor interests in both countries.
- Similar bilateral investment agreements have already been established with the United Arab Emirates (UAE), Oman, and several Central Asian nations.
- India is currently conducting Bilateral Investment Protection Agreement negotiations with multiple nations, including Canada and Russia.
- If negotiations proceed as scheduled, India expects to finalize agreements with three additional countries by the end of this year.

(iii) India–US Trade Deal and Trade Deficit

- The India–US Trade agreement has not been finalized yet, though active and intense negotiations are underway.

- A defining feature of India–US trade relations is that the current trade balance remains in India's favor.
- The United States seeks to reduce its trade deficit and recoup economic losses it considers to have accrued over several years.

(iv) India–China Trade Disparities & Strategic Policy

- Unlike trade relations with the US, the trade balance between India and China is not in India's favor.
- The trade imbalance between India and China has been expanding rapidly since 2014.
- Sitharaman questioned whether India can adopt a US-style strategy toward China, noting the challenge of determining how far negotiations can extend if trade and reducing trade deficits are treated as the primary criteria.

4. india and switzerland have decided to increase bilateral trade

(i) High-Level Visit & Official Reception

- Swiss President Guy Parmelin arrived in India on a 3-day official state visit, marking his second visit to the country after attending the AI summit in Delhi in February.
- External Affairs Minister S. Jaishankar met President Parmelin for bilateral talks, praising Switzerland's commitment to advancing India-Switzerland relations under the 2024 Trade and Economic Partnership Agreement (TEPA) signed with the European Free Trade Association (EFTA).

(ii) Strategic Bilateral Talks & Key Accords

- Prime Minister Narendra Modi and President Parmelin held comprehensive discussions in Delhi to explore new opportunities for strengthening bilateral ties and increasing trade.
- The two nations signed 5 major agreements covering transport infrastructure, migration and mobility partnership, young professionals exchange, transport technologies, and infrastructure development.

- These agreements will create extensive avenues for Indian students, researchers, young professionals, and skilled workers in Switzerland.

(iii) Economic Vision, Investment, and Trade Goals

- Under the Trade and Economic Partnership Agreement (TEPA), India aims to attract $100 billion USD in investments from Switzerland and create over 10 lakh (1 million) direct jobs in India over the next 15 years.
- Innovation, infrastructure, and modern technology were highlighted as the main pillars of the India-Switzerland partnership.
- Both countries agreed to provide greater market access for Indian exporters in Switzerland, expanding exports in agriculture, pharmaceuticals, textiles, and engineering goods.
- India seeks to attract new Swiss investments in key sectors including biotechnology, life sciences, banking, insurance, food processing, and sustainability.

(iv) Defense, Nuclear Energy, & Infrastructure Collaboration

- Both leaders identified new opportunities for collaboration in defense exchanges, defense equipment manufacturing, and expanding cooperation in the nuclear energy sector.
- Existing infrastructure collaboration between the two nations is reflected in major projects such as the Varanasi Ropeway project, Noida Jewar Airport, mountain railway lines, and tunnel projects.

(v) Global Peace, Values, & AI Summits

- Both nations affirmed their commitment to democratic values, the rule of law, dialogue, and working together for global peace and stability.
- India reiterated its support for all meaningful efforts toward establishing peace regarding both the Ukraine conflict and Middle East issues.
- Both countries agreed on the necessity of reforming international organizations to address growing global challenges.

- Following India's hosting of the world's largest AI summit in February, PM Modi extended his best wishes to Switzerland, which is scheduled to host an international AI summit in Geneva next year.

5. Unobstructed Space path

(i) World Space Week & Historical Milestones

- Humanity's space travel began on October 4, 1957, with the launch of Sputnik-1, the world's first artificial satellite.
- The international treaty governing the peaceful use of outer space entered into force on October 10, 1967.
- World Space Week is celebrated globally from October 4 to October 10 to honor these two milestone events.
- The World Space Week Association selects a central theme each year in coordination with the United Nations Office for Outer Space Affairs (UNOOSA). Recent themes include 'Space and Sustainability' (2022) and 'Living in Space' (2025).

(ii) The 2026 Theme: 'Rocket Revolution' & Technological Breakthroughs

- The 2026 theme, 'Rocket Revolution', highlights major leaps in propulsion, launch architecture, and manufacturing that reduce barriers to Earth orbit.
- Commercial pioneers developed Vertical Takeoff and Vertical Landing (VTVL) systems, transforming multi-million-dollar disposable rockets into reusable vehicles that lower costs and increase launch frequency.
- Next-generation launch vehicles, such as SpaceX's fully integrated 'Starship', unlock payload capacities exceeding 100 metric tons, paving the way for permanent lunar habitats and interplanetary travel.
- High-frequency small launch vehicles allow universities, regional institutions, and developing nations to deploy CubeSats and nanosatellites without waiting years for rideshare slots on major rockets.

- Manufacturing engine components via 3D printing has cut production timelines from months to days, while research into non-toxic, bio-derived, and methane fuels aims to reduce environmental impacts.
- Lower launch costs power Earth observation satellite constellations, direct-to-satellite broadband, weather monitoring, and scientific exploration. Private sector participation alongside Government agencies creates new industries, investments, jobs, and makes space accessible to global students, researchers, and entrepreneurs.

(iii) India's Space Milestones & Global Role

- India's ISRO and growing space startups deliver reliable, low-cost launch services, with the Satish Dhawan Space Centre in Sriharikota serving as the primary launch site.
- Through Chandrayaan-3, India became the first nation in the world to land a spacecraft on the Moon's South Pole.
- India successfully reached Mars on its first attempt with Mangalyaan and launched the Aditya-L1 solar observation mission.
- India's PSLV rockets have placed hundreds of foreign satellites into orbit, establishing the country as a leader in cost-effective space launch services.

6. Three new judges were appointed to the Supreme Court on Monday. With these appointments, the total number of Supreme Court judges increased to 37.

(i) On September 28, the Collegium recommended the appointment of Gujarat High Court Chief Justice Sunita Agarwal, Delhi High Court Chief Justice Devendra Kumar Upadhyaya, and Telangana High Court Chief Justice Aparesh Kumar Singh as judges of the Supreme Court. Subsequently, Union Minister of State for Law and Justice Arjun Ram Meghwal announced that they had been appointed as judges of the Supreme Court.

(ii) The sanctioned strength of the Supreme Court is 38 judges, including the Chief

Justice of India. With the appointment of these three new judges, the total number of judges has increased to 37.

- At the same time, the number of women judges has increased to three.
- Justice B. V. Nagarathna has already been serving in the Supreme Court since 2021. Justice V. Mohana assumed office in June. With the latest appointments, Justice Sunita Agarwal becomes the third woman judge of the Supreme Court.