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Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

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On April 27, 2026, India and New Zealand signed a landmark **Free Trade Agreement (FTA)**, often referred to as a "New Generation" trade deal. This pact is significant not just for its economic implications but for the speed of its negotiation (March 2025 – December 2025) and its strategic alignment within the Indo-Pacific region.

India, New Zealand sign 'historic' trade deal

- Deal will be implemented following ratification by the New Zealand Parliament later this year
- Trade pact is a milestone, showing 'convergence of values, trust and shared ambition', says PM
- This FTA is one of the fastest negotiated by India; talks began in March and concluded in Dec. 2025

T.C.A. Sharad Raghavan
NEW DELHI

India and New Zealand on Monday signed a Free Trade Agreement (FTA) that Prime Ministers of both the countries hailed as a "historic" step towards deepening trade, investment, and people-to-people ties.

The FTA, signed by Commerce Minister Piyush Goyal and his New Zealand counterpart Todd McClay in New Delhi, will see New Zealand removing tariffs on all goods imported from India, while India will remove or reduce tariffs on 95% of current imports from New Zealand.

"Today marks a historic milestone in India's journey towards deeper global engagement and shared prosperity," a statement read out by Mr. Goyal quoted Prime Minister Narendra Modi, who is currently in West Bengal, as saying.

"The signing of the India-New Zealand Free Trade Agreement reflects our strengthening economic partnership and a convergence of values, trust and shared ambition between two vibrant democracies."

The FTA, discussions for which were announced in March 2025 and concluded in December 2025, is one of the fastest India has negotiated.

The deal still needs to be ratified by New Zealand's Parliament, which Mr. McClay said would happen soon while adding that it would come into force within this year.

New Zealand Prime Minister Christopher Luxon, in a statement read out by Mr. McClay, said that during a time of global uncertainty, this FTA is a clear commitment by both sides to a stable, predictable and rules-based trade.

"And the India-New Zealand story is about more than trade," Mr. Luxon said. "New Zealand and India are building a relationship that is bigger, deeper and more exciting every year – across trade, investment, defence, sport, and innovation."

Deal dynamics

The graphic lists select products on which India will be reducing or eliminating tariffs, as well as items excluded from the deal. New Zealand has removed tariffs on all items

Immediate elimination
- Wood | Wool
- Leather-raw hides

Phased elimination
- Petroleum oil
- Vegetable oils
- Select electrical machinery

Tariff reductions
- Wine and pharma
- Polymers, aluminum, iron and steel articles

Products excluded by India
- Dairy products (milk, cream, whey, yoghurt, cheese etc.)
- Animal products (other than sheep meat)
- Agricultural products (onions, chana, peas, corn, almonds etc.)
- Sugar | Artificial honey
- Copper and Articles thereof (Cathodes, cartridges, rods)
- Aluminium and articles thereof (Ingots, billets etc.)

Sealing the deal: Union Minister of Commerce and Industry, Piyush Goyal, with New Zealand's Minister for Trade and Investment, Todd McClay, during the signing ceremony of the FTA in New Delhi on Monday. SUSHIL KUMAR VERMA

Gains beyond trade

India's exports to New Zealand grew 32.1% in 2024-25 to $711.1 million, the latest full financial year for which data is available. Imports from New Zealand grew 75.2% to $587.1 million over the same period.

"This FTA is far more than an agreement on tariffs and rules of origin," Mr. Goyal said. "It is a comprehensive framework spanning market access, agricultural productivity, investment, and mobility, designed to benefit manufacturing, farmers, artisans, MSMEs, women entrepreneurs, students, and skilled professionals across both nations."

Apart from the tariff concessions, the FTA also includes several provisions relating to mobility of working professionals and students from India.

Mr. McClay exuded confidence that the deal would benefit New Zealander exporters substantially.

The FTA includes a provision wherein New Zealand has committed to facilitate $20 billion in investments into India over the next 15 years.

"Our Make in India flagship initiative offers synergy to New Zealand's investment commitment of $20 billion in India and delivers a vibrant partnership that goes beyond trade," Mr. Modi said in his statement.

Industry hails deal

Industry bodies and exporters welcomed the deal. "The FTA will open new avenues for Indian exporters by enhancing market access to New Zealand across key sectors such as agriculture, textiles, pharmaceuticals, engineering goods, and services such as IT & ITES, business services, engineering, education, construction and health services," President of the Federation of Indian Export Organisations S.C. Ralhan said.

The Confederation of India Industry, in a statement, said that New Zealand's commitment to facilitate $20 billion in investment is expected to spur the development of industrial infrastructure, manufacturing ecosystems, and innovation clusters across India.

India has managed to negotiate the exclusion of several key items from the deal, including all dairy products such as milk, cream, whey, yoghurt, cheese, etc., animal products other than sheep meat, vegetable products such as onions, chana, peas, corn, almonds, etc., sugar, artificial honey, animal, vegetable or microbial fats and oils, arms and ammunition, gems and jewellery, and copper and aluminium and products.

1. Key Highlights of the Agreement

- **Tariff Liberalization:**
  - **India's Gains:** New Zealand will provide **100% duty-free access** for all Indian exports. This particularly benefits labor-intensive sectors like textiles, leather, gems and jewellery, and engineering goods.
  - **New Zealand's Gains:** India has offered market access on **70.03% of tariff lines** (covering 95% of the value of current imports from NZ). 30% of these lines will see immediate duty elimination.
- **The "$20 Billion" Investment Commitment:** New Zealand has committed to facilitating **$20 billion in FDI into India over 15 years**, focusing on infrastructure, manufacturing, and innovation clusters.
- **Mobility and Services:**
  - **Temporary Employment Entry (TEE):** A quota of **5,000 annual visas** for skilled Indian professionals (IT, Healthcare, AYUSH, Yoga instructors, and Chefs).
  - **Student Mobility:** Provisions for post-study work visas (up to 4 years for PhDs) and a "Working Holiday" scheme for 1,000 young Indians annually.

- **Exclusions (The "Red Lines"):** India successfully protected sensitive domestic sectors. **Dairy products** (milk, cheese, etc.), certain agricultural goods (onions, pulses, sugar), and specific metals are excluded from tariff concessions.

2. Strategic and Economic Significance

A. Defensive Trade Policy

India's refusal to include dairy—a core interest for New Zealand—highlights the "vulnerability-first" approach in Indian trade policy. Protecting the livelihoods of roughly 80 million Indian dairy farmers was a non-negotiable prerequisite, learning from the previous RCEP withdrawal.

B. Beyond "Goods": The Talent-Led Partnership

Unlike traditional FTAs that focus solely on commodities, this deal emphasizes **"Talent and Technology."** By securing visas for AYUSH practitioners and traditional chefs, India is utilizing the FTA to project its **Soft Power** and enhance the "Global South" leadership narrative.

C. Geopolitical Alignment

The deal strengthens the **Indo-Pacific** architecture. As both nations seek to reduce supply chain dependency on a single large neighbor (China), this bilateral pact serves as a "Plus One" strategy for economic resilience.

3. Challenges and Roadmap

Challenge	Detail
Ratification	Must be passed by the New Zealand Parliament; internal coalition politics (e.g., NZ First) may pose minor hurdles.
Trade Imbalance	Currently, India's trade deficit with NZ is small, but the challenge remains to scale up manufacturing to utilize 100% duty-free access.
SPS/TBT Barriers	New Zealand has very strict Sanitary and Phytosanitary (SPS) standards. Indian agri-exporters must upgrade quality to meet these "non-tariff" barriers.

Conclusion

The India–New Zealand FTA marks a shift toward **pragmatic bilateralism**. For India, it is a blueprint for balancing "Atmanirbhar Bharat" (Self-Reliant India) with global integration—protecting the dairy farmer while opening doors for the IT professional. For New Zealand, it provides high-level access to the world's most populous market. As the deal moves toward ratification later in 2026, its success will depend on how effectively Indian MSMEs can penetrate the New Zealand market and how the promised $20 billion investment translates into ground-level infrastructure in India.

UPSC Prelims Exam Practice Question

Ques:Consider the following statements regarding the India–New Zealand Free Trade Agreement (2026):

1.New Zealand has provided 100% duty-free access to all Indian exports.

2.India has offered tariff liberalization on more than 90% of tariff lines.

3. Dairy products are included under tariff concessions by India.

Which of the statements given above is/are correct?

(a) 1 only

(b) 1 and 2 only

(c) 2 and 3 only

(d) 1, 2 and 3

Ans: a)

UPSC Mains Exam Practice Question

Ques: "The India–New Zealand FTA reflects a shift from multilateralism to pragmatic bilateralism."Critically examine.**(150 Words)**

Page 07:GS III :Science & Technology / Prelims Exam

A pioneering study published in Science (February 2026) by researchers at Columbia University and Memorial Sloan Kettering has addressed the "Achilles' heel" of immunotherapy: **Antigen Heterogeneity**. By developing a hyper-sensitive receptor, scientists have successfully targeted "hidden" cancer cells in solid tumors like kidney and ovarian cancer, which were previously invisible to standard CAR-T treatments.

CAR-T cell therapy senses 'faint' targets to clear solid tumours

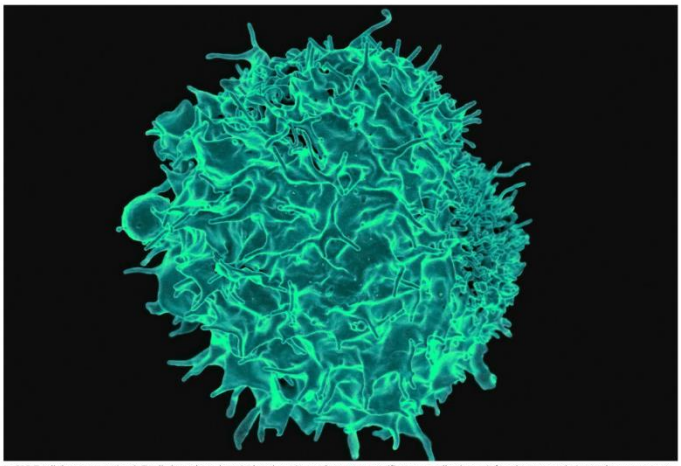
Scientists have developed a highly sensitive receptor that can detect trace amounts of proteins on solid tumours, overcoming a major biological hurdle to using CAR T-cell therapy against cancers such as kidney or ovarian cancer; this can help eliminate previously undectable tumour cells

Anirban Mukhopadhyay

Chimeric antigen receptor (CAR) T-cell therapy, an approach that modifies a patient's own immune cells to hunt down cancer, has transformed treatment for blood cancers such as leukaemia and lymphoma. But the same strategy has struggled when applied to solid tumours such as kidney or ovarian cancer.

One of the biggest obstacles is antigen heterogeneity. Tumours are not made of identical cells. Instead, they resemble a patchwork: some cells display the protein that CAR-T cells detect while others appear to lack it. CAR-T cells only destroy 'visible' targets, so the invisible cells survive and allow the cancer to grow back.

Now, a study published in *Science* on February 26 has suggested these supposedly invisible cells may not be invisible after all. Many tumour cells thought to lack the target protein actually carry small amounts – too little for current CAR-T cells to detect.



In CAR T-cell therapy, a patient's T cells (one shown) are isolated, engineered to target specific cancer cells, then reinfused to mount their attack. NIAID/UNSPLASH

The hidden protein

The study conducted by researchers in Columbia University and the Sloan Kettering Cancer Centre in New York focused on a protein called CD70. It is expressed by the tumours in about 70-80% of kidney and ovarian cancers and roughly a quarter of pancreatic cancers, making it an attractive target for immune therapy.

But in real world scenarios, some cells carry large quantities of CD70 while others appear negative in standard laboratory tests.

The researchers suspected that these negative cells might still produce small amounts of the protein.

To check this, they examined individual tumour cells and studied how the gene for CD70 was being regulated. They discovered that it was being suppressed by an enzyme called EZH2, which chemically modifies proteins around DNA.

These modifications tighten the DNA structure, making it difficult for the cell to read the gene and reducing CD70 production to very low levels. This effectively dimmed the signal, making the cells undetectable to current immune therapies.

Detailed imaging in two kidney cancer models found more than 80-90% of tumour cells that appeared CD70-negative by conventional tests still carried detectable amounts of the protein.

Scott Lowe, a cancer biologist at the Sloan Kettering Institute, said tumours may keep these tiny amounts of the protein because they still need it to survive. "If the cancer cells need some of the protein to stay viable, there may be evolutionary pressure to keep it at very low levels rather than lose it completely," he said.

The researchers called this phenomenon 'pseudo-heterogeneity' – the target protein is present in nearly all tumour cells but sometimes at levels too low for detection.

If cancer cells hide the target rather than eliminate it, the solution may be to build immune cells that detect faint signals.

Making T-cells more sensitive

To do this, the researchers developed a new receptor design called an HLA-independent T-cell (HIT) receptor.

Traditional CAR-T cells use receptors with molecular components that tell the immune cell when to attack. These triggers usually require a strong signal, meaning many copies of the target protein must be present on a cancer cell to elicit a response from T-cells.

The HIT receptor takes a different approach. Instead of changing the strength of the signal, it connects the cancer-detecting sensor directly to the T-cell's natural activation pathway – the internal system T-cells normally use to recognise infected cells – while bypassing the HLA system, the genetic ID tag that T-cells usually require to identify a target.

By co-opting this natural machinery, the receptor becomes able to detect antigens at much lower densities than a synthetic CAR.

A cancer biologist who peer-reviewed the study for the journal said anonymously that the finding could change how CAR-T therapies are designed: "If this principle holds for other tumour targets, it could change how we design CAR-T therapies. Instead of searching for perfectly uniform targets, we may need receptors that can detect very low levels of antigen."

Testing the idea

The team tested the approach using xenograft models, in which real human tumour tissue is implanted in mice. These models closely mimic the complexity of cancers found in patients.

> If the cancer cells need some of the protein to stay viable, there may be evolutionary pressure to keep it at very low levels rather than lose it completely.
>
> **SCOTT LOWE**
> Cancer biologist at the Sloan Kettering Institute

In kidney cancer models, conventional CAR-T cells initially shrank tumours but eventually failed. The remaining cancer cells, those with extremely low CD70 levels, survived and allowed the tumour to grow back.

The T-cells with the HIT receptor however eliminated these previously undetectable tumour cells. The researchers also observed complete and lasting tumour eradication in several models of kidney, ovarian, and pancreatic cancer with these T-cells.

Power versus safety

Increasing sensitivity raised one concern, however: "When you make immune cells better at detecting weak signals, you also have to be careful they don't start reacting to normal cells that carry small amounts of the same protein," the researcher quoted earlier said.

This problem is often called the "Goldilocks challenge" of cell therapy. To evaluate this risk, the researchers analysed a large single-cell atlas of 30 human tissues and 222 different cell types, finding that CD70 activity was largely absent from most vital organs such as the heart, lungs, and brain.

A significant exception was activated immune cells, which naturally express CD70 during immune responses. But even in those tissues, the protein appeared only in a small fraction of cells, typically less than 5%.

In experimental models, the engineered T-cells did attack some activated immune cells but the researchers called the effects temporary and manageable.

The biologist noted that future therapies will have to include additional safeguards: "If these treatments move into patients, researchers will likely add safety systems such as molecular switches so doctors can turn the cells off if necessary."

A new hope

Professor Lowe said the finding fits a broader pattern cancer biologists have been observing for years.

There is strong evidence that changes in how genes are turned on or off in cancer cells (without changing the DNA itself) can help tumour cells survive targeted therapies, he said. "These cells, often called drug-tolerant persisters, can tolerate treatment and later allow the tumour to regrow."

The researcher quoted earlier has tempered expectations for now. "It is still a long way from bedside application but if this strategy works in clinical trials, it could help tackle the biggest hurdle in cancer immunotherapy," he said.

As he suggested, for patients with kidney or ovarian tumours, where treatment options are still limited, being able to uncover and eliminate these hidden cells could make a real difference.

(Anirban Mukhopadhyay is a geneticist by training and science communicator from New Delhi. anirban.genetics@south.du.ac.in)

1. The Core Problem: Antigen Heterogeneity vs. Pseudo-heterogeneity

- **The "Invisible" Cell Problem:** Standard CAR-T therapy works like a lock-and-key mechanism. If a cancer cell doesn't have enough "locks" (antigens/proteins) on its surface, the "key" (CAR-T cell) cannot see it. This leaves behind a patchwork of survivor cells that cause cancer relapse.
- **The CD70 Discovery:** Researchers found that in 70-80% of kidney and ovarian cancers, cells that appeared "negative" for the protein **CD70** actually possessed trace amounts of it.
- **Pseudo-heterogeneity:** The study reveals that the protein isn't absent; it's just "dimmed." An enzyme called **EZH2** tightens the DNA structure, suppressing the gene expression to levels too low for conventional CAR-T cells to detect.

2. The Innovation: HLA-Independent T-cell (HIT) Receptors

To solve this, researchers moved away from synthetic triggers and co-opted the T-cell's natural machinery.

- **Mechanism:** The **HIT receptor** links the cancer-detecting sensor directly to the T-cell's natural activation pathway.
- **Sensitivity:** It bypasses the HLA system (the genetic ID tag) and can detect antigens at much lower densities than traditional CARs.
- **Efficacy:** In mice models (xenografts), while standard CAR-T cells allowed tumors to regrow, HIT-receptor T-cells achieved **complete and lasting eradication** across kidney, ovarian, and pancreatic cancer models.

3. Safety and the "Goldilocks Challenge"

A major concern with high-sensitivity therapy is **"Off-target" toxicity**—the risk that these super-sensitive cells might attack healthy organs.

- **Risk Mitigation:** Researchers used a "Single-cell Atlas" to verify that CD70 is largely absent in vital organs (heart, lungs, brain).
- **Manageable Toxicity:** While the engineered cells attacked some activated immune cells (which naturally express CD70), the effect was temporary.
- **Future Safeguards:** Clinical versions of this therapy will likely include "molecular switches" or "suicide genes" that allow doctors to deactivate the T-cells if they begin attacking healthy tissue.

4. Significance for Science & Technology

Feature	Conventional CAR-T	HIT-Receptor Therapy
Primary Target	Blood Cancers (Leukaemia/Lymphoma)	Solid Tumors (Kidney, Ovarian, Pancreatic)
Sensitivity	Requires high antigen density	Detects "faint" trace signals

Feature	Conventional CAR-T	HIT-Receptor Therapy
Activation	Synthetic signaling domains	Natural T-cell activation pathway
Outcome	High relapse in solid tumors	Potential for complete eradication

Conclusion

The transition from treating "liquid" blood cancers to complex "solid" tumors represents the next frontier in oncology. This research challenges the long-held belief that tumor cells are fundamentally different (heterogeneous) and suggests instead that they are simply "hiding" in plain sight via epigenetic suppression. If clinical trials confirm these findings, it could pave the way for a universal design in immunotherapy—prioritizing sensitivity over specificity—offering a new lease of life to patients with advanced-stage solid malignancies.

UPSC PrelimsExam Practice Question

Ques: In the context of the recent study, CD70 protein is important because:

(a) It destroys cancer cells directly

(b) It acts as a tumor antigen target for immunotherapy

(c) It suppresses immune response

(d) It is present only in healthy cells

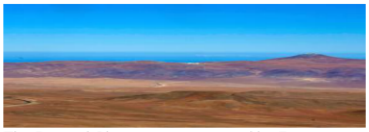
Ans:b)

UPSC Mains Exam Practice Question

Ques: How can breakthroughs in Immunotherapy reshape the future of cancer treatment in India? Discuss opportunities and limitations.(**150 Words)**

Page 07 :GS III :Environment / Prelims Exam

The Atacama Desert in Chile, long considered the world's premier window into the universe, is currently facing a critical challenge. A recent conflict between the **Paranal Observatory** and a proposed green energy complex has highlighted the growing threat of **Light Pollution** and the inadequacy of existing environmental regulations to protect "dark sky" corridors.



The Paranal Observatory operated by European Southern Observatory stands in the Atacama Desert, Chile, April 14, 2026. AP

Light pollution threatens the world's clearest skies

Associated Press

It takes a moment for the eyes to adjust. A faint spark appears in the darkness; then another, brighter one. Soon, stars, planets and entire constellations emerge. Before long, a whole galaxy stretches across the sky, visible to the naked eye.

In Chile's Atacama Desert, the night sky feels infinite. Considered the driest place on the earth, its darkness is also one of the clearest windows to the universe.

A rare combination of dry climate, high altitude, and isolation from urban light pollution makes the Atacama an unrivalled hub for world-class astronomy and home to the world's largest ground-based astronomical projects.

"The conditions in the Atacama Desert are unique in the world," said Chiara Mazzucchelli, president of the Chilean Astronomical Society. "There are more than 300 clear nights per year, meaning no clouds and no rain."

But these skies may be at risk.

A rare combination of dry climate, high altitude, and isolation from light pollution makes the Atacama a hub for astronomy and home to some of the largest astronomical projects

Last year, the desert became a battleground between scientists and an energy firm proposing a green power complex just kilometres from the Paranal Observatory. Managed by the European Southern Observatory (ESO), the site also is the future home to what is to be the most powerful optical telescope.

Although the energy project was cancelled in January following an appeal from astronomers and physicists, it exposed concerns that existing sky preservation laws are outdated and unclear. Since then, several rural environmental regulations have come under review.

The so-called Photon Valley in Chile is a high-altitude corridor where several observatories operate side by side using some of the most sophisticated instruments ever engineered.

"ESO's telescopes in particular are the most powerful astronomical facilities on the planet," said Itziar de Gregorio-Monsalvo, the ESO representative in Chile.

Every year, the Atacama Desert draws thousands of astronomers and scientists from around the world. "We are lucky to be here," said Julia Bodensteiner, an assistant professor at University of Amsterdam.

Walking across the Atacama's rocky, uneven terrain is no easy task. At altitudes exceeding 3,000 m, oxygen becomes a luxury, while scorching days give way to relentlessly cold nights. But for space observation, the more than 105,000 sq. km of desert are the perfect setting.

The exceptional conditions of the Atacama have enabled some of the most ambitious astronomical projects ever conceived, like the Extremely Large Telescope, ELT — a $1.5 billion endeavor by ESO scheduled for completion in 2030.

With 798 mirrors and a light-gathering area of nearly 1,000 square metres, the ELT will be 20 times more powerful than today's leading telescopes and 15-times sharper than Hubble Space Telescope.

Twenty years ago, the Atacama Desert was "an ocean of darkness," recalled Eduardo Unda-Sanzana, director of the Astronomy Center at the University of Antofagasta.

Over the years, however, the landscape has changed drastically. Driven by urban sprawl, industrial development, and the arrival of mining and wind farms, the desert has become coveted territory where balance is not always easy to reach.

1. The Strategic Importance of the Atacama (The "Photon Valley")

The Atacama Desert is home to some of the most ambitious ground-based astronomical projects, including the European Southern Observatory's (ESO) facilities. Its status as an unrivalled hub is due to:

- **Atmospheric Conditions:** The driest place on Earth with over 300 clear nights per year, ensuring minimal interference from water vapor or clouds.
- **High Altitude:** At elevations exceeding 3,000 meters, the atmosphere is thinner, providing sharper images of distant celestial bodies.
- **Geographical Isolation:** Traditionally, the desert provided a vast "ocean of darkness" away from urban centers, crucial for detecting faint signals from the early universe.

2. Emerging Threats: The Conflict of Interests

The very factors that make the Atacama ideal for astronomy also make it attractive for other modern industries, leading to a "territorial battle":

- **Green Energy Infrastructure:** While vital for climate goals, large-scale wind and solar farms introduce artificial light through security lighting, maintenance hubs, and aircraft warning lights.
- **Urban Sprawl & Industry:** Expansion of mining operations and nearby urban areas in Chile has introduced significant **Light Pollution**, which scatters in the atmosphere and creates "sky glow," drowning out the light from distant stars.
- **Legal Lacunae:** The recent cancellation of a power project near Paranal (January 2026) revealed that current sky preservation laws are outdated and struggle to balance industrial development with scientific preservation.

3. The Stakes: Future Projects

The preservation of these skies is essential for upcoming multi-billion dollar scientific endeavors:

- **Extremely Large Telescope (ELT):** Scheduled for completion in 2030, this $1.5 billion project will be the world's most powerful optical telescope.

- **Scientific Capability:** The ELT is designed to be **15 times sharper than the Hubble Space Telescope**. However, its extreme sensitivity makes it even more vulnerable to trace amounts of artificial light pollution.

4. Significance for UPSC

Factor	Impact on Astronomy
Light Pollution	Increases background sky brightness, making it impossible to observe faint galaxies and exoplanets.
Sanitary & Environmental Law	Highlights the need for "Dark Sky Reserves" as a formal category in International Environmental Law.
Technological Leap	ELT and ALMA (Atacama Large Millimeter/submillimeter Array) represent the pinnacle of human engineering, requiring specific "geographical niches."

Conclusion

The "Photon Valley" of Chile represents a global heritage of scientific discovery. The recent friction between energy firms and astronomers serves as a wake-up call for the international community. Protecting the Atacama is not merely about preserving a view; it is about ensuring that humanity's most advanced "eyes" can continue to function. As Chile reviews its environmental regulations in 2026, the goal will be to create a sustainable framework where green energy and deep-space exploration can coexist without one extinguishing the light of the other.

UPSC Prelims Exam Practice Question

Ques:The term "Light Pollution" refers to:

(a) Emission of harmful gases into the atmosphere

(b) Excessive or misdirected artificial light that interferes with natural darkness

(c) Radiation from space affecting Earth's atmosphere

(d) Heat trapped due to greenhouse gases

Ans:b)

UPSC Mains Exam Practice Question

Ques: How can policy frameworks balance climate goals (renewable energy) with scientific priorities (astronomy)? Suggest a regulatory model.**(150 Words)**

Page 09:GS II : Social Justice / Prelims Exam

This article, written by **Mamidala Jagadesh Kumar** (Chairman, Review Committee for NEP 2020), discusses the Central Board of Secondary Education's (CBSE) decision to introduce **Computational Thinking (CT)** and **Artificial Intelligence (AI)** for classes 3–8 starting from the 2026-27 academic session.

Can middle school students engage with AI?

Recently, the Central Board of Secondary Education (CBSE) decided to introduce a Computational Thinking (CT) and Artificial Intelligence (AI) curriculum for classes 3-8, which will begin from the 2026-27 academic session. CT skills generally refer to abstraction, decomposition, pattern recognition, and algorithmic thinking. These skills are required to reason about intelligent systems and to understand how machine learning differs from rule-based computation. As with any transformational reform in education, it is necessary to examine the practicality of introducing computational concepts to middle school learners. Will it align with age-appropriate pedagogy for engaging with emerging digital and computational environments?

Global precedents

One first has to examine whether CBSE's curriculum clearly links CT and AI, since such a relationship is conceptually necessary. The foundational design principle behind the Organisation for Economic Co-operation and Development and the European Commission's AI Literacy Framework identifies CT as a precursor to AI learning. This framework recommends CT competencies across age bands beginning from early primary school. Similarly, the AI4K12 Initiative in the U.S. places CT-related competencies at the base of its "Five Big Ideas in AI." Their CT-competencies progression plan spans K-2, 3-5, 6-8, and 9-12 grade bands. The CBSE's sequencing broadly aligns with these comparative curricular architectures. However, its curriculum is designed independently in line with the National Education Policy (NEP), 2020 and the National Curriculum Framework for School Education (NCF-SE), 2023.

UNESCO also identifies topics such as "What is AI?", "Foundations of computing", and "Data literacy" as necessary for school students. Learners need to start cultivating logical thinking from an early stage and gradually build problem-solving skills. They also need opportunities to develop a basic understanding of AI as part of their broader digital learning.

Mamidala Jagadesh Kumar

Chairman, Review Committee for NEP 2020, Ministry of Education and former Chairman, UGC. Views are personal

The CBSE curriculum includes introductory discussions on AI fairness, responsible use, and digital safety. This focus is broadly consistent with cross-national practices

Tackling inherent risks

There are, of course, risks associated with children interacting with AI. The CBSE curriculum includes introductory discussions on AI fairness, responsible use, and digital safety. This focus is broadly consistent with cross-national practices. For instance, the AI4K12 guidelines include topics such as recognising when AI systems may mislead; identifying bias in datasets; and distinguishing between AI and human capabilities across all age groups. But can children meaningfully engage with such content at a young age? Classroom-based interventions, including studies conducted in U.S. middle schools, led to interesting outcomes. They suggest that learners in the 11-13 age group can engage with AI ideas when supported by structured pedagogical interventions. These studies reveal that introducing ethical dimensions of AI at this stage can be pedagogically feasible.

A growing body of empirical research suggests that introducing concepts such as supervised learning or predictive modelling is viable for learners in the 11-14 age group. Many comprehensive research studies on AI in K-12 education suggest that school-age participants as young as 10-12 years can work with fundamental AI concepts. Thus, the CBSE's CT-AI framework appears compatible with the learning capacities observed in this age group.

Many international initiatives encourage the use of no-code tools for introductory AI learning. Multiple empirical studies show that by using such tools, middle school learners can design, build, test, and reflect on their projects without coding. For this reason, the CBSE's expectation that Class 8 students can attempt to solve real-world problems using no-code tools is supported by several international initiatives.

However, children may start attributing human-like traits or capabilities to AI tools, although these tools do not actually possess them. Does the CBSE curriculum address this challenge by creating awareness among children? The CBSE's curriculum contains topics discussing ethical use, fairness, and responsible digital behaviour. Such discussions can help reduce children's misconceptions about AI. These modules can support better understanding and the prudent use of AI systems.

The CBSE curriculum follows a cross-disciplinary design by integrating CT into Mathematics and 'The World Around Us' course for Classes 3-5. Global experiences which involved cross-disciplinary instructional models reported improvements in students' reasoning and problem-solving in several contexts. The CBSE's pedagogical orientation reflects similar design principles.

Away from rote learning

One problem in Indian education is the habit of rote learning. CT and AI learning have the potential to encourage inquiry-driven, reflective learning rather than traditional rote-based methods. The CBSE curriculum emphasises practical modelling, reflection, and ethical reasoning. This approach can therefore contribute to ongoing efforts to move classroom practices away from rote-based methods.

International practices and available research suggests that middle school is an appropriate stage to introduce foundational CT-AI elements. The CBSE's CT-AI curriculum is structured to make thoughtful and effective use of this developmental stage in learners' growth, and it exhibits coherence with the vision of the NEP 2020.

1. Conceptual Framework: CT as a Precursor to AI

The curriculum is built on the principle that **Computational Thinking** is the foundation for understanding AI.

- **CT Skills:** Includes abstraction, decomposition, pattern recognition, and algorithmic thinking.
- **The Logic:** Before students can understand how a machine "learns," they must understand how logic-based systems differ from data-driven machine learning.
- **Global Alignment:** This approach mirrors the **AI4K12 Initiative (USA)** and the **UNESCO** guidelines, which advocate for digital literacy and "foundations of computing" at the primary and middle school levels.

2. Pedagogy: From Rote Learning to Inquiry-Based Learning

A significant highlight of the new curriculum is its potential to reform the Indian "rote learning" culture.

- **No-Code Tools:** Research suggests that students aged 11–14 can engage with complex concepts like supervised learning and predictive modeling using no-code platforms. This allows them to build and test projects without the barrier of complex syntax.
- **Cross-Disciplinary Integration:** For classes 3–5, CT is integrated into Mathematics and environmental studies ("The World Around Us"). This encourages students to apply logical reasoning to real-world scenarios rather than treating "computers" as an isolated subject.

3. Addressing Risks and Ethics

Introducing AI to children comes with inherent psychological and ethical risks, which the curriculum seeks to mitigate:

- **Anthropomorphism:** Children often attribute human-like traits to AI. The curriculum includes modules to help students distinguish between human intelligence and machine capabilities.
- **AI Ethics:** Topics such as **identifying bias in datasets**, recognizing when a system is misleading, and ensuring **digital safety** are introduced early.
- **Classroom Findings:** Empirical studies show that students in the 11–13 age group are capable of meaningful engagement with the ethical dimensions of AI when supported by structured teaching.

4. Alignment with National Policies

The initiative is a direct implementation of:

- **NEP 2020:** Which emphasizes 21st-century skills and mathematical thinking.
- **NCF-SE 2023:** Which provides the roadmap for a competency-based school education framework.

5. Summary Table for Quick Reference

Feature	Details
Target Group	Classes 3–8 (Academic Session 2026-27)
Core Skills	Abstraction, Pattern Recognition, Decomposition, Algorithmic Thinking
Key Tools	No-code AI platforms for practical projects
Major Goal	Shift from rote learning to inquiry-driven, reflective learning
Ethical Focus	Bias detection, digital safety, and responsible AI use

Conclusion

The introduction of AI and CT at the middle school level is not merely about technical training; it is a **transformational reform** aimed at cognitive development. By aligning with international benchmarks and focusing on "Ethics-first" pedagogy, the CBSE curriculum seeks to prepare Indian students for a digital future while addressing the nuances of human-AI interaction. For the Indian education system, this represents a crucial step in moving away from traditional memorization toward a problem-solving mindset.

UPSC Prelims Exam Practice Question

Ques:The introduction of AI and CT in school education is aligned with which of the following?

1.National Education Policy 2020

2.National Curriculum Framework for School Education 2023

3.Right to Information Act

Select the correct answer:

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

Ans :a)

UPSC Mains Exam Practice Question

Ques: Discuss how the introduction of Computational Thinking and Artificial Intelligence in school education can transform the Indian education system.**(150 words)**

Page :12:GS III : Indian Economy/ Prelims Exam

Symbiosis Skills and Professional University (SSPU), Pune, has achieved a significant milestone by launching Asia's first UNESCO Chair on Gender Inclusion and Skill Development. The announcement was made during the international conference "Women Leading the Future of Work," highlighting India's growing role in global educational and gender equity frameworks.

Symbiosis unveils Asia's first UNESCO chair on Gender Inclusion & Skill Development

The Hindu Bureau
MUMBAI

Symbiosis Skills and Professional University (SSPU), Pune, announced the launch of a UNESCO Chair on Gender Inclusion and Skill Development, the first of its kind in Asia, at an International Conference on "Women Leading the Future of Work", organised in collaboration with UNESCO.

The Chair was formally inaugurated by Jayant Chaudhary, Minister of State (Independent Charge) for Skill Development & Entrepreneurship and Minister of State for Education, Government of India, recently. Aditi Tatkare, Minister for Women & Child Development, Government of Maharashtra, and Monica Nagelgaard, Consul General of Norway attended the conference.

Under its aegis, 10,000 girls have been trained in future skills in sunrise sectors

The UNESCO Chair initiative is spearheaded by Dr. Swati Mujumdar, Pro-Chancellor, SSPU, which has developed a unique industry-integrated skilling model, enabling large-scale training of underprivileged girls in different domains with strong employment outcomes. Under the aegis of this Chair, 10,000 girls have been trained on future skills in sunrise sectors such as robotics, automation and semi-conductor technology, advanced manufacturing and defence technology.

1. Key Highlights of the UNESCO Chair

- **Pioneering Status:** This is the **first UNESCO Chair in Asia** specifically dedicated to the intersection of gender inclusion and vocational skilling.
- **Leadership:** The initiative is spearheaded by **Dr. Swati Mujumdar**, Pro-Chancellor of SSPU.
- **Target Demographic:** Focuses on an industry-integrated model to provide large-scale training to **underprivileged girls**.
- **Impact to Date:** Under this initiative, **10,000 girls** have already been trained in "future skills" within sunrise sectors.

2. Focus on "Sunrise Sectors"

The Chair emphasizes training in high-growth, high-tech areas where women are traditionally underrepresented. These include:

- **Robotics and Automation**

- **Semiconductor Technology**
- **Advanced Manufacturing**
- **Defense Technology**

3. Strategic Importance

A. Alignment with National Goals

The inauguration by the **Minister of State for Skill Development & Entrepreneurship** underscores the project's alignment with national missions like **Skill India**, **Make in India**, and **Beti Bachao Beti Padhao**. It bridges the gap between basic education and high-value employability.

B. International Collaboration

The presence of the **Consul General of Norway** and the **UNESCO** partnership signals a move toward international best practices in vocational pedagogy. The UNESCO Chair program generally facilitates knowledge sharing and "North-South-South" cooperation.

C. Addressing the Gender Gap in STEM

By targeting sunrise sectors like semiconductors and robotics, the Chair directly addresses the **Gender Gap** in Science, Technology, Engineering, and Mathematics (STEM). This is crucial for improving India's **Female Labour Force Participation Rate (FLFPR)**, especially in high-productivity sectors.

4. The SSPU "Industry-Integrated" Model

The Chair utilizes a unique model that moves beyond theoretical classroom learning:

- **Practical Training:** Hands-on experience in specialized labs.
- **Employment Outcomes:** Direct linkages with industry requirements to ensure that training translates into sustainable careers.
- **Social Equity:** By focusing on underprivileged girls, the model promotes social mobility and economic independence.

Conclusion

The establishment of this UNESCO Chair at Symbiosis marks a paradigm shift in how India approaches Skill Development. It moves the needle from "generic labor training" to "high-tech inclusion."This represents a prime example of Social Infrastructure and Human Resource Development), as well as the application of Emerging Technologies in social upliftment. As these 10,000 trained girls enter the workforce, they provide a blueprint for how academic institutions can lead the charge in creating an equitable and technologically advanced future.

UPSC Mains Exam Practice Question

Ques: Discuss the role of higher educational institutions in promoting gender inclusion and skill development in India. Illustrate with recent examples.**(250 Words)**

A tightening of the fist in India's digital public square

Vikram Raj

Journalist associated with the Internet Freedom Foundation

The draft amendments to India's Information Technology Rules trigger fears of digital overreach and a departure from existing judicial rulings

Imagine this. You leave a sharp, satirical comment on social media or under a news article about rising fuel prices, and it gets a few likes. A few hours later, the comment disappears. The platform does not explain. Your account remains, but you notice that posts on similar topics no longer appear publicly. You have not been charged with any offence. No court has issued an order. Yet something has quietly shifted.

This is not a far-fetched scenario. It is a plausible outcome under the draft amendments to India's Information Technology Rules released by the Ministry of Electronics and Information Technology (MeitY) on March 30, 2026. Presented as technical clarifications, the changes mark a deeper transformation in how speech is governed online and who gets to decide its limits.

Core area of concern

At the centre of concern is a proposed expansion of executive power that risks bypassing Parliament and the courts. One provision, Rule 3(4), would require platforms to comply with a wide array of government-issued instruments, including advisories, directions and standard operating procedures, as a condition for retaining "safe harbour" protection under Section 79 of the IT Act. In plain terms, platforms would be legally safer if they follow government instructions, even when those instructions do not arise from formal law.

This sits uneasily with the Supreme Court of India's landmark ruling in *Shreya Singhal vs Union of India* (2015), which held that platforms are only required to act on unlawful content when they receive a court order or a government notification grounded in law. By allowing informal directives to trigger compliance obligations, the draft rules appear to dilute that constitutional safeguard.

The likely result is not targeted moderation but broad over-censorship. Faced with uncertain and potentially unpublished directives, platforms will err on the side of removal. It is the predictable logic of risk management. When liability is unclear, speech becomes expendable.

A second shift expands the scope of state oversight far beyond traditional publishers. Amendments to Rule 8 bring ordinary users who post or share news and current affairs content within the ambit of the government's oversight mechanism. This includes the Inter-Departmental Committee, a body empowered to review content and recommend blocking.

This is not merely an administrative adjustment. It reintroduces, through a different route, a regulatory framework that has already faced judicial scrutiny. In 2021, the Bombay High Court stayed key provisions of the IT Rules, citing concerns under Article 19(1)(a) of the Constitution. The Madras High Court later observed that such oversight could undermine media independence. Those challenges remain pending. Yet, the new draft effectively reconstructs the same architecture while those questions are unresolved.

An undefined role

Equally troubling is the transformation of the Inter-Departmental Committee itself. Originally designed to address grievances, it is now empowered to examine any "matter" referred by the Ministry of Information and Broadcasting. The term is left undefined. A procedure is currently in place under Rule 14 but compliance remains an issue. There is no clear threshold for intervention, and no guarantee that affected users will be heard before action is taken.

This shift from grievance redress to proactive scrutiny changes the character of the body. It becomes less a forum for dispute resolution and more an instrument of preemptive control.

The third major concern lies in expanded data retention obligations. The draft clarifies that platform duties to retain user data operate in addition to requirements under any other law. In practice, this could mean that personal data, browsing activity and communication records are stored for extended periods, potentially years, depending on overlapping legal mandates.

The risks here are not abstract. Longer retention increases the surface area for misuse, whether through unauthorised access, data breaches or function creep. It also alters the relationship between citizens and digital spaces. When every interaction may be archived indefinitely, self-censorship follows naturally.

Taken together, these amendments signal a shift toward a model where executive discretion plays a dominant role in shaping online speech. The concern is not only about individual provisions but about their cumulative effect. Each change reinforces the other. Informal directives gain force through safe harbour rules. Oversight expands to include ordinary users. Data retention deepens the state's informational reach.

Upsetting the balance

Supporters of the policy may argue that governments require flexible tools to manage harmful content. That is true in principle. But constitutional systems impose limits on how that power is exercised. Delegated legislation must remain within the bounds of its parent statute, a principle affirmed in cases such as *Indian Express Newspapers vs Union of India* (1986). When rules begin to create new obligations that are not clearly grounded in law, the balance between regulation and overreach begins to tilt.

The short public consultation period, which ended on April 14, only heightens the concern. Changes of this magnitude deserve wider debate, legislative scrutiny and careful alignment with existing judicial rulings.

India's digital public sphere has grown precisely because it has allowed a diversity of voices, from professional journalists to ordinary citizens. That openness has always required some regulation. The question now is whether the new rules preserve that openness or narrow it through administrative control.

The answer will shape not only how platforms operate but also how freely citizens can speak, critique, and participate in public life.

GS PaperII :Polity & Governance

UPSC Mains Exam Practice Question:"Delegated legislation must operate within constitutional limits."Examine this statement in the context of the draft IT Rules, 2026.**(150 Words)**

Context : The article by Vikram Raj discusses the significant implications of the draft amendments to India's **Information Technology (IT) Rules**, released by the Ministry of Electronics and Information Technology (MeitY) on

March 30, 2026. These rules represent a shift toward increased executive control over online discourse, potentially altering the constitutional balance of free speech.

1. Key Concerns: The "Three Pillars" of the Amendments

A. Dilution of "Safe Harbour" (Rule 3(4))

- **The Concept:** Section 79 of the IT Act provides "Safe Harbour" (legal immunity) to intermediaries (social media platforms) for content posted by users.
- **The Shift:** The draft rule requires platforms to comply with **informal instruments** like "advisories" or "standard operating procedures" (SOPs) to keep this immunity.
- **Constitutional Conflict:** This appears to bypass the **Shreya Singhal vs Union of India (2015)** ruling, which mandated that platforms only act on content via a formal court order or a law-backed government notification.
- **Risk:** To avoid legal liability, platforms may engage in **proactive over-censorship**, removing content that is merely "disliked" by the government but not necessarily "unlawful."

B. Expansion of Oversight (Rule 8 & Rule 14)

- **Targeting Individuals:** The rules now bring **ordinary users** who share news/current affairs within the oversight of the **Inter-Departmental Committee (IDC)**.
- **Preemptive Control:** The IDC has shifted from a "grievance redressal" body to a "proactive scrutiny" body. It can now examine any "matter" referred by the Ministry of Information and Broadcasting (MIB) without a defined threshold.
- **Judicial History:** Similar oversight mechanisms were stayed by the Bombay and Madras High Courts in 2021 for potentially violating **Article 19(1)(a)** (Freedom of Speech).

C. Deepened Data Retention

- **The Requirement:** Platforms must retain user data (browsing activity, records) for extended periods, potentially years, as these duties now operate in addition to other laws.
- **Privacy Risk:** Increased data retention increases the risk of data breaches and "function creep" (using data for purposes other than why it was collected).
- **Self-Censorship:** The awareness of permanent archiving often leads to a "chilling effect," where citizens refrain from criticizing policy for fear of future repercussions.

2. Legal and Constitutional Principles Involved

Principle / Case	Relevance to the 2026 Draft Rules
Article 19(1)(a)	The fundamental right to freedom of speech and expression. The rules may impose "unreasonable restrictions."
Shreya Singhal (2015)	Established that online speech cannot be restricted by informal executive whims; it requires a "legal" trigger.

Principle / Case	Relevance to the 2026 Draft Rules
Indian Express (1986)	Affirmed that **Delegated Legislation** (rules made by Ministries) cannot exceed the powers given by the "Parent Statute" (the IT Act).
Doctrine of Proportionality	Any state intervention in speech must be the "least restrictive" method possible to achieve a legitimate aim.

3. Implications for the Digital Public Square

- **Executive Dominance:** The rules shift the power of content moderation from the Judiciary/Parliament to **Executive Discretion**.
- **Impact on Media Independence:** By regulating ordinary users as "publishers," the distinction between professional journalism and private opinion is blurred, subjecting both to state review.
- **Chilling Effect:** The cumulative effect of informal directives and long-term data storage may result in a "tighter fist" over digital expression, discouraging dissent and satire.

Conclusion

The 2026 draft amendments to the IT Rules reflect a global trend toward "platform responsibility," but in the Indian context, they raise serious questions about **Constitutional overreach**. While the government argues these are "technical clarifications" needed for a safer internet, critics argue they reconstruct a regulatory architecture previously questioned by the High Courts. As the consultation period concludes, the focus remains on whether India can maintain a "Digital Public Square" that balances safety with the robust, uninhibited speech essential for a vibrant democracy.