

02/04/2026 Daily current affairs

Prelims articles:

1. *Yuva Vigyani Karyakram (YUVIKA):*

Context: Responding to an Unstarred Question in the Lok Sabha during the ongoing Budget Session of Parliament, raised by Smt. Anita Nagarsingh Chouhan, Dr. Jitendra Singh informed that YUVIKA has been specifically designed to develop interest in space science among students at an early stage.

About Yuva Vigyani Karyakram (YUVIKA):

- ❖ YUVIKA (Young Scientist Programme) is an initiative by Indian Space Research Organisation to promote space science awareness among school students.
- ❖ Full form: YUva VIgyani KAryakram.
- ❖ Objective: “Catch them young” by encouraging early interest in STEM fields.
- ❖ Focus: Impart basic knowledge of space technology, space science, and applications.
- ❖ Target group: Students who completed Class 8 and are studying in Class 9.
- ❖ Selection basis: Academic performance (Class 8) and extracurricular activities.
- ❖ Special weightage is given to students from rural areas.
- ❖ Participation: 3 students selected from each State/UT annually.
- ❖ Covers students from CBSE, ICSE, and State Boards.
- ❖ Tie-break rule: Younger students are given preference.
- ❖ Programme duration: Two-week residential training.
- ❖ Activities include lectures, lab visits, scientist interactions, and practical sessions.
- ❖ Ensures minimum representation from each State/UT.
- ❖ Aim: Encourage students to pursue careers in science, technology, engineering, and mathematics (STEM).

2. *E20 Fuel:*

Context: Directive from the Ministry of Petroleum and Natural Gas force (1st April 2026), requiring to dispense E20 fuel with a minimum 95 RON octane rating in the country. RON (Research Octane Number) serves as an indicator of fuel stability and indicates the level of pressure generated during fuel combustion within a vehicle's engine.

About E20 Fuel:

- ❖ Ethanol (C_2H_5OH), considered a renewable fuel, is an anhydrous ethyl alcohol produced from sugarcane, maize, wheat, and other crops with high starch content.
- ❖ It is naturally produced by the fermentation of sugars by yeasts or via petrochemical processes such as ethylene hydration.
- ❖ Ethanol blending programme was started in 2003 to promote ethanol blending in petrol.
- ❖ Definition: Mixing ethanol with petrol to make fuel cleaner and more sustainable.
- ❖ Blending Types: E10 (10% ethanol), E20 (20%), E85 (85%).
- ❖ E20 Benefits: Better acceleration, improved ride quality, and 30% lower carbon emissions vs. E10.
- ❖ Target: 20% ethanol blending in petrol by 2025-26 (advanced from 2030).

3. *Remotely Piloted Strike Aircraft (RPSA) programme:*

Context: Indian Air Force (IAF) is preparing to induct unmanned stealth fighters under the Remotely Piloted Strike Aircraft (RPSA) programme.

About Remotely Piloted Strike Aircraft (RPSA) programme:

- ❖ Aeronautical Development Agency leads the RPSA (Remotely Piloted Strike Aircraft) programme.
- ❖ RPSA aims to develop indigenous UCAVs (Unmanned Combat Aerial Vehicles).
- ❖ The UCAV under development is called Ghatak UCAV.
- ❖ UCAVs are armed drones carrying missiles and bombs for combat operations.
- ❖ Used for precision strikes, surveillance, and high-risk military missions.
- ❖ Ghatak is a stealth-capable drone designed to avoid radar detection.
- ❖ It is based on a flying-wing configuration for reduced radar signature.
- ❖ Capable of conducting deep-strike missions inside enemy territory.
- ❖ Designed to penetrate heavily defended airspace.
- ❖ Eliminates risk to human pilots during dangerous missions.
- ❖ Enhances India's autonomous warfare and strategic strike capabilities.

4. *Artemis II Mission:*

Context: NASA has successfully launched its historic Artemis II mission, marking the first crewed journey towards the Moon in more than 50 years.

About Artemis II Mission:

- ❖ Artemis II will be the first human mission to the Moon's vicinity since 1972
- ❖ It is the second mission under the Artemis program and the first crewed flight
- ❖ First mission to carry astronauts on Space Launch System and Orion spacecraft
- ❖ Follows Artemis I (2022) which was an uncrewed test flight around the Moon
- ❖ Marks the first human journey beyond low Earth orbit in over 50 years
- ❖ Four astronauts will undertake a 10 day mission around the Moon and return to Earth
- ❖ Crew includes three NASA astronauts and one from Canadian Space Agency
- ❖ Mission aims to test life support systems crew performance and deep space capabilities
- ❖ Carries scientific payloads to study space radiation human health behavior and communication systems
- ❖ Data collected will help assess readiness for future lunar missions
- ❖ Prepares for Artemis III mission aimed at landing humans on the Moon by 2028
- ❖ Orion spacecraft will perform high speed reentry and splashdown in the Pacific Ocean near San Diego

5. *Piped natural gas (PNG):*

Context: Recently, Anjan Kumar Mishra, Secretary at the Petroleum and Natural Gas Regulatory Board, said that domestic natural gas production alone could cater to 30 crore connections if all were to switch to piped natural gas (PNG).

What is the difference between LPG, LNG, PNG, and CNG?

- ❖ LPG is a co-product of oil refining and natural gas processing. That is, its production depends on the processing of both crude oil and natural gas.

- ❖ Liquefied Natural Gas (LNG), as the name suggests, is natural gas that has been cooled to below –160 degrees Celsius to turn it into a liquid for shipping. Liquefaction reduces its volume by 1,000 times.
- ❖ Compressed Natural Gas (CNG) is primarily used as a vehicular fuel. It involves compressing natural gas to a pressure of 200-250 kg/cm² (g) to reduce its volume and enable efficient distribution.
- ❖ LPG consists mainly of propane and butane gases that are compressed cooled and transported in liquid form
- ❖ LPG is filled in cylinders and delivered directly to households
- ❖ Natural gas is transported through pipelines as piped natural gas (PNG)
- ❖ Imported natural gas is first converted into Liquefied Natural Gas for transport via ships
- ❖ LNG carriers use specialized tanks to maintain extremely low temperatures
- ❖ At the destination LNG is regasified into natural gas
- ❖ Regasified gas is then supplied to consumers through pipelines
- ❖ LPG has easier last mile delivery through cylinders using trucks and small vehicles
- ❖ PNG requires extensive pipeline infrastructure to reach households
- ❖ India prefers LPG for domestic cooking due to easier distribution and lower infrastructure requirements

Increasing demand for PNG:

- ❖ Import Dependence: India imports a higher share of LPG compared to natural gas with around 3/5th of LPG demand met through imports
- ❖ Supply Sources: LPG imports are concentrated mainly from Saudi Arabia and Qatar while Liquefied Natural Gas has diversified global sources
- ❖ Strategic Risk: Around 90% of LPG imports pass through Strait of Hormuz making supply vulnerable to disruptions
- ❖ Consumption Pattern: India consumes about 34 million tonnes of LPG annually but produces only around 12 million tonnes domestically
- ❖ Natural Gas Balance: LNG imports and domestic natural gas production are roughly equal at about 27 million tonnes each
- ❖ Future Availability: Global LNG supply expected to improve with new liquefaction capacities coming up
- ❖ Energy Efficiency: Natural gas provides more energy per kg compared to LPG
- ❖ Domestic Use: PNG can act as a near substitute for LPG in household cooking with minimal differences
- ❖ Industrial Use: Switching from LPG to PNG in industries may require equipment modification or recalibration
- ❖ Adoption Challenges: Lack of awareness and technical expertise may slow down transition in MSME sector

6. TAK-003 (called 'Qdenga'):

Context: India's long wait for a dengue vaccine may finally be coming to an end. Takeda's tetravalent dengue vaccine, TAK-003 (called 'Qdenga'), recently received clearance from the Subject Expert Committee (SEC) under the Drugs Controller General of India (DCGI) for use among individuals aged 4 to 60 years.

More about:

- ❖ **Shift in Strategy:** Introduction of TAK-003 marks a shift from reactive vector control to preventive vaccination against Dengue
- ❖ **Key Advantages:** Proven in large global trials safe and effective especially in reducing severe dengue and hospitalisation without need for pre-screening
- ❖ **Public Health Impact:** Can reduce hospital burden mortality and pressure on healthcare system even if it only lowers severe cases
- ❖ **Serotype Challenge:** Dengue has four serotypes (DENV-1 to DENV-4) making vaccine development complex due to uneven immunity
- ❖ **Major Limitation:** Strong protection against DENV-2 moderate for DENV-1 but weaker for DENV-3 and DENV-4 especially in first-time infections
- ❖ **Epidemiological Concern:** Rising share of DENV-3 in India may reduce overall effectiveness of the vaccine
- ❖ **Nature of Protection:** Vaccine reduces severity rather than preventing infection so outbreaks may continue and vector control remains essential
- ❖ **Cost & Accessibility:** Expensive (₹6,000–12,000 full course) with two doses raising concerns about affordability and coverage
- ❖ **Future Outlook:** Indigenous vaccines like DengiAll, developed by Panacea Biotec in collaboration with the Indian Council of Medical Research and next-gen candidates may offer broader protection and better suitability for mass use.

About TAK-003 (called 'Qdenga'):

- ❖ TAK-003 (Qdenga) is a live attenuated tetravalent vaccine designed to protect against all four dengue virus serotypes
- ❖ Developed by Takeda Pharmaceutical Company using DENV-2 as the genetic backbone for all serotypes
- ❖ Administered in two doses given three months apart for effective immunity
- ❖ Approved in multiple regions including European Union UK and several dengue endemic countries
- ❖ Can be given irrespective of prior dengue infection unlike earlier vaccine Dengvaxia
- ❖ Tested in large global trials involving more than 28,000 participants across multiple countries
- ❖ Shows around 80% efficacy against dengue infection and over 84–90% protection against hospitalisation
- ❖ Provides long term protection with effectiveness sustained up to about 4.5 years though it declines over time

About Dengue:

- ❖ It is caused by the dengue virus (DENV).
- ❖ It is transmitted to humans through the bites of infected female mosquitoes, primarily the *Aedes aegypti* mosquito.
- ❖ The severe form of dengue fever, also called dengue hemorrhagic fever which can cause serious bleeding, a sudden drop in blood pressure.
- ❖ It is more common in tropical and subtropical climates.

- ❖ The most common symptoms are high fever, headache, body aches, nausea and rash.
- ❖ There is no specific treatment for dengue.
- ❖ The dengue vaccine CYD-TDV or Dengvaxia was approved by the US Food & Drug Administration in 2019, the first dengue vaccine to get the regulatory nod in the US.
- ❖ The key driver behind the rising dengue cases is soaring temperatures.

Mains specific articles:

1. *Biological Diversity (Amendment) Act, 2023:*

Context: Regulatory reforms under Biological Diversity (Amendment) Act, 2023 lead to surge in IPR filings.

About Biological Diversity (Amendment) Act, 2023:

- ❖ The Biological Diversity (Amendment) Bill, 2021 seeks to amend the Biological Diversity Act, 2002 to promote the Indian system of medicine and cultivation of wild medicinal plants, facilitate faster processes for research, patent applications, and transfer of research outcomes, decriminalise offences by replacing criminal penalties with monetary fines, and encourage greater foreign investment in the biodiversity and bio-resource sector.
- ❖ Amends provisions of the Biological Diversity Act, 2002 to simplify access and promote ease of doing research.
- ❖ Revises classification of entities and modifies rules for access to biological resources and traditional knowledge.
- ❖ Introduces exemptions and reduces compliance requirements for certain users of biological resources.
- ❖ Prior approval/ intimation requirements for accessing biological resources are rationalised.
- ❖ Approval from National Biodiversity Authority is now required **before grant of IPR**, not at the application stage.
- ❖ Aims to facilitate faster patent filing while retaining regulatory oversight.
- ❖ Narrows scope of **benefit sharing** by excluding research, bio-survey, and bio-utilisation from its applicability.
- ❖ Benefit sharing continues for commercial utilisation with local communities and traditional knowledge holders.
- ❖ Recognises benefit claimers as conservers of biodiversity and holders of traditional knowledge.
- ❖ Decriminalises offences under the Act to promote ease of compliance.
- ❖ Replaces imprisonment provisions with monetary penalties.
- ❖ Prescribes penalties ranging from ₹1 lakh to ₹50 lakh for violations.

2. *R.S. Mooshahary committee recommendations:*

Context: The Government had constituted a Review Committee headed by Shri R.S. Mooshahary to review the recommendations of earlier Commissions/ Committees on police reforms. The Committee had shortlisted 49 recommendations.

Major recommendations:

- ❖ Strengthen police infrastructure and manpower in conflict-prone and sensitive areas.
- ❖ Increase recruitment of local youth into police forces to improve trust and intelligence gathering.
- ❖ Establish **specialised battalions** trained for handling ethnic and communal violence.
- ❖ Improve coordination between police, intelligence agencies, and local administration.
- ❖ Modernise policing with better equipment, mobility, and communication systems.
- ❖ Ensure **community policing** to build confidence among different ethnic groups.
- ❖ Set up **fast-track mechanisms** for investigation and prosecution of violence-related cases.
- ❖ Enhance training of police in **conflict resolution and human rights**.
- ❖ Strengthen border policing to check illegal migration and related security issues.
- ❖ Ensure accountability and transparency in police functioning to improve public trust.

Quick Bites:

- ☐ Union Budget 2026–27 has announced the establishment of dedicated Rare Earth Corridors in the states of Odisha, Kerala, Andhra Pradesh, and Tamil Nadu. These corridors will focus on mining, processing, research, and manufacturing.
- ☐ The Ministry of Textiles has extended the Rebate of State and Central Taxes and Levies (RoSCTL) Scheme for exports of apparel/garments and made-ups up to 30th September 2026 or until approval of the Scheme for the 16th Finance Commission cycle by the competent authority, whichever is earlier. The extension is without any change in existing guidelines. Operational since 7th March 2019, the RoSCTL Scheme aims to rebate all embedded State and Central taxes and levies not covered under any other scheme, thereby enhancing the global competitiveness of India's apparel and made-ups exports.
- ☐ The European Space Agency has advanced satellite navigation by successfully launching the first two satellites of the Celeste in-orbit demonstration mission, namely Celeste IOD-1 and IOD-2, aboard the Electron rocket from New Zealand on 28 March, with the satellites separating about an hour after launch, marking Europe's effort to strengthen the resilience and performance of its navigation systems.

Practice questions:

Objective questions:

The primary objective of the Rebate of State and Central Taxes and Levies (RoSCTL) Scheme is

- (a) To provide subsidies to textile manufacturers
- (b) To promote domestic consumption of apparel products
- (c) To regulate pricing of garments in international markets
- (d) To offset taxes to enhance export competitiveness in textile sector

With reference to the YUVIKA, consider the following statements

1. It is an initiative of the Indian Space Research Organisation to promote space science awareness among school students
2. It is open to students studying in Class 11 and 12th, selected based on board exam marks
3. It provides a two week residential programme including lectures lab visits and interaction with scientists

Which of the statements given above are correct

- (a) 1 and 3 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1,2 and 3

With reference to Liquefied Natural Gas (LNG), consider the following statements

1. It is natural gas converted into liquid form by cooling to about -160°C
2. Its volume reduces significantly making it easier to transport
3. It can be supplied directly to households without the need of regasification

Which of the statements given above are correct

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1 2 and 3

Mains practice question:

Discuss the key challenges in police reforms in India, particularly in conflict-prone and sensitive areas. In this context, examine the recommendations of the committee headed by R.S. Mooshahary for strengthening policing and internal security. (250 words)

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