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Editor's Note

As the famous saying goes, we can choose our friends, but not our enemies. When it comes to neighbours, India's relationships often shift between cooperation and contention. In this edition of Pala Civil Times, we examine two of India's important neighbours, China and Bangladesh, and explore how border tensions, energy-related challenges, growing protectionism and competition in bilateral trade shape their relationships with India. Our Editorial Decoder examines how the latest Index of Core Industries may present an incomplete picture of India's broader industrial performance. We also turn to the evolving debate on artificial intelligence and literature, asking a fundamental question: What makes art, art? In the Science section, we examine the eMudhra certificate flaw and its implications for digital security and trust.

Each topic has been carefully curated to help learners understand the key issues, connect current developments with their broader significance and strengthen their preparation without feeling overwhelmed by information. We hope our readers engage thoughtfully with these articles and find them useful in building a stronger foundation for their competitive examinations.

Happy reading!

P7. SCIENCE

Editorials Decoded

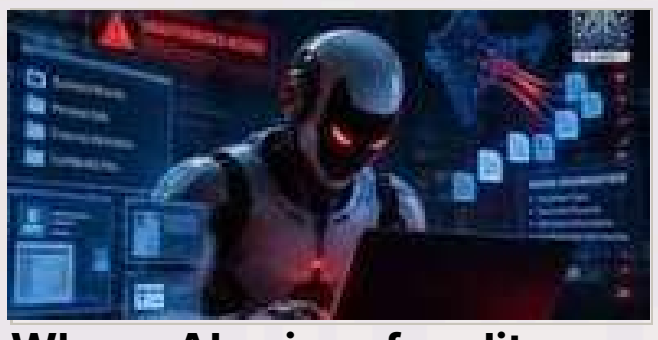
THE HINDU

The Indian EXPRESS



Canary in the coal mine: On the performance of India's core industrial sectors

Examines how strong growth in the Index of Core Industries can mask underlying weaknesses in industrial performance, including uneven sectoral growth, declining domestic crude oil output, and rising oil import costs.



When AI vies for literary glory

Explores France's award for books co-written with Artificial Intelligence (AI) and the wider debate over literary creativity, authorship, copyright and the recognition of AI-assisted writing.



eMudhra Certificate Flaw: Implications for Internet Security

The eMudhra incident demonstrates that Internet security depends not only on encryption but also on the reliability of the institutions entrusted with verifying digital identities.

India–China Border Tensions: Arunachal Pradesh, Military Preparedness and Strategic Challenges

Confrontations between Indian and Chinese troops have continued at multiple locations along the Arunachal Pradesh border, according to Indo-Tibetan Border Police (ITBP) Director General Shatrujeet Kapur. The reported stand-off near Asaphila, close to Taksing in Upper Subansiri district, highlights continuing tensions along the Line of Actual Control (LAC), despite repeated high-level border talks. India is strengthening its border preparedness through specialised high-altitude commandos, drone and counter-drone systems, and underground shelters. These developments reflect the need to combine diplomatic engagement with military readiness along the disputed border.

What is the situation along the Arunachal Pradesh border?

Stand-off near Asaphila: Government sources reported that Indian and Chinese troops confronted each other near Maja in the Taksing circle during routine patrolling in July. Chinese People's Liberation Army (PLA) personnel reportedly returned in greater numbers and pitched tents at an elevated location around 6–7 km within India's perception of the LAC.

Increased military deployment: India has strengthened its deployment along the border. ***The Indian Army and ITBP conduct long-range patrols in forward areas, particularly between June and October, when weather conditions permit.***

Diplomacy has not resolved the tension: The confrontations have continued despite multiple rounds of high-level border talks and the participation of Chinese President Xi Jinping in the 18th BRICS Summit hosted by India in September.

PYQ COMPASS

Q. Which one of the following pairs of States of India indicates the easternmost and westernmost State? (2015)

a) Assam and Rajasthan
b) Arunachal Pradesh and Rajasthan
c) Assam and Gujarat
d) Arunachal Pradesh and Gujarat

How is India strengthening its border preparedness?

Shaurya commandos: The ITBP has raised specialised Shaurya commandos for high-altitude mountain operations. The force plans to establish a full battalion, reinforcing its original mountain-warfare role alongside its border-guarding responsibilities.

Drone and counter-drone technology: The ITBP is modernising its equipment to address the limitations of older weapons and respond to China's technological advances. It has introduced drone platoons in border-guarding battalions, begun training drone pilots and started developing drones in-house.

Dedicated modernisation funding: According to the ITBP chief, ₹280 crore, or 70% of a ₹400-crore modernisation allocation, had been spent on drones. A further ₹1,000 crore has been earmarked for drones under another modernisation scheme worth ₹3,500–4,000 crore.

Underground shelters: The ITBP plans to establish underground shelters alongside existing overground structures at border outposts over the next three years. These shelters are intended to provide protection during conflict and will incorporate essential facilities such as ventilation, drainage and sanitation

The continuing confrontations in Arunachal Pradesh demonstrate that diplomatic engagement has not eliminated the underlying India–China border dispute. India must combine credible deterrence with sustained diplomacy, economic resilience and careful management of escalation to protect its territorial interests and maintain regional stability.

India–Bangladesh Relations: Historical Tensions and Strategic Interests

The return of the Bangladesh Nationalist Party (BNP) to power under Prime Minister Tarique Rahman in February 2026 has opened a new phase in India–Bangladesh relations. Despite deep historical, cultural and economic ties, the relationship continues to face political mistrust rooted in the legacy of the 1971 Liberation War, concerns over Indian dominance and recent political developments in Bangladesh. Both countries have strong reasons to maintain cooperation. The challenge is to move beyond historical grievances and domestic political divisions towards a relationship based on mutual respect, strategic autonomy and shared regional interests.



Why have historical tensions persisted between India and Bangladesh?

Ambivalent legacy of 1971: India played a decisive military role in Bangladesh's liberation from Pakistan. While this generated gratitude, it also created discomfort among sections of Bangladesh's political elite, who viewed the prominent Indian role as diminishing Bangladesh's own achievement.

Fear of Indian dominance: Bangladesh shares a border of more than 4,000 kilometres with India and is surrounded by Indian territory on three sides. Its dependence on shared river systems and regional connectivity has reinforced concerns about its strategic and economic autonomy.

Concerns over national identity: Bangladesh's linguistic and cultural links with West Bengal have sometimes raised fears that close Indian influence could weaken its distinct national identity. Memories of Hindu bhadralok dominance in pre-Partition Bengal also contributed to these anxieties.

Shift in political ideology: Sheikh Mujibur Rahman and Indira Gandhi initially enjoyed close relations. Later governments, particularly under Ziaur Rahman, emphasised a more explicitly Islamic form of Bangladeshi nationalism, distancing the country from the Bengali linguistic nationalism associated with the liberation movement.

How has Bangladesh's domestic politics shaped bilateral relations?

Competing political orientations: The Awami League has generally been associated with the secular and Bengali-nationalist legacy of 1971 and closer ties with India. The BNP and its allies have traditionally been more suspicious of New Delhi.

Strategic diversification: Bangladesh has pursued closer relations with Pakistan, China and the United States to balance India's regional power. Dhaka views this as an assertion of strategic autonomy, although New Delhi has sometimes interpreted it as anti-Indian positioning.

Perceived Indian support for Sheikh Hasina: India's close association with Hasina's government increasingly became controversial as criticism of its authoritarian character grew within Bangladesh. New Delhi was perceived by some as prioritising security interests over democratic developments in its neighbour.

Post-2024 political crisis: Sheikh Hasina's removal from power in August 2024 and her flight to India intensified suspicions about Indian involvement in the former political order. India's refusal to extradite her has remained a major bilateral irritant.

A new political phase: Tarique Rahman's election as Prime Minister in February 2026 provides an opportunity to reset relations. However, political change alone cannot eliminate long-standing mutual distrust.

PYQ COMPASS

Q. Evaluate the economic and strategic dimensions of India's Look East Policy in the context of the post Cold War international scenario. (GS II - 2016)

What are the major areas of cooperation?

India and Bangladesh have complementary interests across economic, infrastructure, energy, capacity-building and cultural sectors.

Economic and trade cooperation: Both countries can strengthen supply chains and reduce non-tariff barriers.

An agreement in 2023 envisaged resuming negotiations on a Comprehensive Economic Partnership Agreement (CEPA) by 2026.

Infrastructure and connectivity: Rail, road and inland waterway links can improve regional trade and revive historic connections. The **Akhaura–Agartala rail link** supports connectivity between Bangladesh and India's North Eastern region, including the movement of bulk industrial raw materials.

Energy cooperation: Cross-border electricity transmission can improve regional energy security. In 2025, Nepal exported 40 megawatts of electricity to Bangladesh through India's transmission network, demonstrating the potential for regional energy integration.

Capacity building: India provides training, scholarships and institutional support to strengthen governance capacity in Bangladesh. More than 2,600 Bangladeshi officials have been trained since 2014, and a 2025–2030 Memorandum of Understanding provides for training another 1,500 officials.

Cultural cooperation: Shared historical, linguistic and cultural links provide a foundation for people-to-people relations. The Indira Gandhi Cultural Centre in Dhaka promotes yoga, music, classical arts and literary exchanges, including events associated with Rabindra Jayanti and Nazrul Jayanti.

Why are stable bilateral relations important?

Geographical interdependence: Bangladesh's location and shared river systems make a workable relationship with India essential for connectivity, water management and regional development.

Regional stability: Cooperation can reduce strategic tensions and strengthen stability across South Asia.

India's regional policies: Strong ties support India's Neighbourhood First and Act East policies, particularly through connectivity with the North Eastern region.

Mutual economic benefits: Improved trade, infrastructure and energy links can support economic growth and strengthen regional supply chains.

Shared security interests: Both countries have an interest in ensuring regional stability and preventing bilateral disagreements from undermining wider cooperation.

What are the key challenges and the way forward?

Move beyond historical expectations: India should not expect its role in the 1971 Liberation War to guarantee lasting Bangladeshi gratitude or political alignment. Bilateral relations must be based on present-day national interests.

Respect strategic autonomy: India should recognise Bangladesh's right to diversify its international partnerships. Bangladesh, in turn, should avoid defining strategic independence primarily through opposition to India.

Separate bilateral relations from individual leaders: India should build durable relations with Bangladesh's institutions and people rather than associating its interests too closely with a particular political party or leader.

India–Bangladesh relations reflect a continuing tension between historical gratitude, national identity and strategic autonomy. Geography and shared interests make sustained cooperation essential, but neither country can build a durable partnership by disregarding the other's concerns. A stable relationship requires India to exercise its power with sensitivity and Bangladesh to pursue strategic autonomy without reflexive opposition to India.

PYQ COMPASS

Q. The protests in Shahbag Square in Dhaka in Bangladesh reveal a fundamental split in society between the nationalists and Islamic forces. What is its significance for India? (GS II - 2013)

When AI vies for literary glory

The growing use of Artificial Intelligence (AI) in writing has raised questions about authorship, copyright and the meaning of literary creativity. While disputes initially focused on the use of copyrighted books to train AI models, attention has increasingly shifted to whether AI-assisted or AI-generated works should be recognised and rewarded through literary prizes. France's newly introduced Prix Pascal de Littérature IA, an award for books co-written with AI, reflects an attempt to formally recognise this emerging form of literary production.

How has the debate over AI and literature evolved?

Copyright disputes: In 2023, the Authors Guild in the United States, along with writers such as John Grisham and George R. R. Martin, sued OpenAI, alleging that copyrighted books had been used without permission to train its AI models.

Controversies over literary awards: The 2026 Commonwealth Short Story Prize faced allegations of AI use in winning entries. Thélyson Orélien's novel was also removed from the Prix Goncourt longlist amid similar allegations.

Formal recognition of AI-assisted writing: France's Prix Pascal de Littérature IA represents an effort to recognise books co-written with AI, shifting the debate from whether AI is used in literature to whether and how such work should be rewarded.

What makes AI-assisted literature controversial?

Authorship and originality: AI can generate polished prose and compelling expressions, raising questions about how much of a work's intellectual and creative contribution belongs to the human author.

Human experience and creativity: Literature involves more than producing well-crafted sentences. It reflects personal experiences, emotions, sustained effort and the struggle to express complex aspects of human life.

Effort versus outcome: Literary prizes traditionally recognise not only the quality of the finished work but also the creativity, discipline and artistic judgement involved in producing it. AI challenges how these contributions should be evaluated.

Transparency and fairness: Undisclosed AI use in literary competitions can raise concerns about the integrity of judging, authorship claims and equal treatment of participants.

What does this debate mean for literary awards?

The central question is what literary prizes are intended to reward: the quality of the finished text, the creative process behind it, or the human experience expressed through it.

Recognition of innovation: AI-assisted writing can introduce new methods of literary experimentation and expand the tools available to writers.

Preserving literary integrity: Awards need clear rules on permissible AI assistance, disclosure requirements and the role of human authorship.

Distinguishing assistance from authorship: Using AI for editing or brainstorming is different from relying on it to generate substantial portions of a work. Assessment criteria should account for this distinction.

What are the broader implications?

Copyright and intellectual property: The use of copyrighted works to train AI models raises questions about consent, ownership, compensation and the protection of creators' rights.

Changing role of writers: AI may assist with drafting and editing, but human judgement, lived experience and creative intent remain important to literary expression.

Meaning of art: If literary value is judged solely by the quality of the final text, the human effort and experience behind artistic creation risk being overlooked.

PYQ COMPASS

Q. What is agentic Artificial Intelligence (AI) ? Explain its working. Describe its applications with suitable examples. Discuss the advantages, risks and challenges associated with agentic AI systems. (GS III - 2026)

Canary in the coal mine: On the performance of India's core industrial sectors

India's Index of Core Industries (ICI) recorded a series-high growth of 7.9% in September 2026, marking the second consecutive month of accelerating growth. However, the improvement may be temporary, driven partly by increased electricity demand, coal consumption and government infrastructure spending, while high oil import costs are adding pressure to the economy.

What is driving industrial growth?

Coal production: Coal output grew by 10.7% in September, despite contracting by 1.1% during April–September 2026. The sharp monthly increase may reflect a low base effect and efforts to replenish power plants' depleting coal stocks amid a heat wave.

Electricity demand: Electricity output grew by 11.4% in September, following sustained double-digit growth during the preceding six months. However, demand may moderate as the heat wave subsides.

Steel and iron ore: Steel production accelerated, supporting a return to double-digit growth in iron ore output. This could benefit the mining component of the broader Index of Industrial Production (IIP).

Dependence on public spending: Cement and steel remain the more sustained sources of core-sector growth, supported substantially by government infrastructure expenditure.

Why do energy trends raise concerns?

Declining domestic production: Crude oil and natural gas output have contracted continuously since 2024, increasing concerns about India's dependence on imported energy.

Rising refinery output: Refinery products grew by 10.3% in September. This increase is linked to greater processing of expensive imported crude oil.

Higher import costs: India's oil imports rose by 7% in volume in September, but their value increased by 47%, reflecting higher international prices.

Global price pressures: Attacks on Saudi Arabia's energy infrastructure pushed global oil prices above $112 per barrel. Although the United States provided relief from potential tariffs linked to Russian oil imports, the earlier discounts on Russian crude had largely disappeared.

(Please refer The Pala Civil Times 22-10-2026)

What are the implications for India's economy?

Pressure on foreign exchange reserves: Higher oil import bills increase demand for foreign currency and add pressure on India's external balance. Foreign exchange reserves are also being used to support the rupee.

Limited growth sustainability: A temporary surge in coal and electricity output may not translate into sustained industrial expansion. Cement and steel growth also remains closely linked to public infrastructure expenditure.

Shrinking fiscal space: Continued government spending supports industrial activity, but rising energy costs and competing expenditure needs constrain the government's fiscal flexibility.

Way Forward

India needs to strengthen domestic energy production, diversify energy imports and accelerate the transition towards reliable alternative energy sources. Sustained industrial growth also requires stronger private investment and broader manufacturing expansion.

PYQ COMPASS

Q. Explain the key challenges for India's energy security. What measures do you suggest for ensuring energy security along with economic growth and sustainability. (GS III - 2026)

Q. Explain the difference between computing methodology of India's Gross Domestic Product (GDP) before the year 2015 and after the year 2015. (GS III - 2021)

eMudhra Certificate Flaw: Implications for Internet Security

Google, Mozilla, Apple and Microsoft blocked digital certificates associated with Bengaluru-based eMudhra after a flaw in cryptographic key generation raised concerns about website authentication and secure Internet communications. The incident prompted a government investigation and highlighted the risks posed by vulnerabilities in trusted Certification Authorities (CAs).

The certificate hierarchy consists of a Root Certification Authority, which anchors trust; an Intermediate Certification Authority, which operates under it and issues certificates; and website certificates, which authenticate websites. If an intermediate authority is compromised, attackers may issue fraudulent certificates, prompting browser companies to block the affected certificates to protect users.

How did the security flaw occur?

Weak cryptographic keys: Eight intermediate CA certificates had private keys generated with insufficient randomness, potentially allowing attackers to reconstruct them within seconds.

Potential misuse: Recovered keys could enable attackers to issue fraudulent certificates, impersonate legitimate websites, intercept communications or make malicious software appear trustworthy.

Discovery and response: An independent security researcher reported the vulnerability on October 17, 2026. Browser companies blocked the affected certificates, while the Ministry of Electronics and Information Technology (MeitY) constituted a special team to investigate the incident.

PYQ COMPASS

Q. Consider the following statements: (2019)
A digital signature is:
1. An electronic record that identifies the certifying authority issuing it
2. Used to serve as a proof of identity of an individual to access information or server on Internet.
3. An electronic method of signing an electronic document and ensuring that the original content is unchanged
Which of the statements given above is/are correct?
a) 1 only
b) 2 and 3 only
c) 3 only
d) 1, 2 and 3

How do digital certificates secure the Internet?

- **Digital certificates** help browsers verify website identities and establish secure connections with web servers.
- **Transport Layer Security (TLS)** is a cryptographic protocol that encrypts Internet communications and helps authenticate servers.
- **Public Key Infrastructure (PKI)** is the framework of cryptographic keys, digital certificates and trusted authorities that enables digital authentication.
- **Certification Authorities (CAs)** issue certificates to verify the identities of websites, individuals or organisations. A compromised intermediate CA can undermine trust in certificates issued under its authority.

What is eMudhra, and why is the incident significant?

Company profile: eMudhra is a Bengaluru-headquartered digital identity and cybersecurity company launched in November 2008 by information technology firm 3i Infotech. It provides digital signatures, electronic signing services and digital certificates.

Market position: Reports show that the firm holds approximately 38% of India's Digital Signature Certificate (DSC) market by value.

Widespread use: Its services and technologies support businesses, financial institutions and government organisations. The supplied reports identify the Unique Identification Authority of India (UIDAI) and the income tax filing portal among government platforms using its certificates or other technology.

The incident posed reputational risks and prompted the company to announce its exit from the Secure Sockets Layer (SSL) and TLS certification business.

How are India's digital signature services regulated?

India's digital signature framework operates under the Information Technology Act, 2000.

Controller of Certifying Authorities (CCA): Licenses and regulates CAs issuing DSCs in India.

Root Certifying Authority of India (RCAI): Established by the CCA, it digitally signs the public keys of Indian CAs, helping relying parties verify their authenticity.

Registration Authority (RA): Assists applicants with DSC applications, document collection and, where applicable, identity verification. The CA remains responsible for verifying applications and issuing certificates.

Digital Signature Certificate (DSC): Establishes the identity of its holder and supports authentication of electronic documents and transactions. Digital signatures have legal recognition under India's information technology framework, subject to applicable legal requirements.

India's CCA-regulated DSC and eSign services are separate from the global browser-trusted TLS certification system affected by this incident. MeitY stated that the domestic DSC and eSign services remained unaffected.

What happens when a CA ceases operations?

Certificate revocation: A CA must follow the prescribed closure procedures, including revoking valid certificates.

Replacement: Subscribers must obtain new DSCs from another licensed CA.

Validity of earlier signatures: Signatures created before revocation remain valid if the certificate was valid when the signature was affixed, subject to applicable validation requirements.

A Sub-CA may operate as a technical arrangement within a CA's infrastructure, but it is not an independent legal entity under the described Indian framework.

Was there evidence of data theft?

Company's position: eMudhra stated that its infrastructure had not been compromised and that no data breach had occurred.

Certificate transparency: Google reported that no website certificates linked to the six affected website-certification authorities had been recorded in certificate transparency logs before its blocking action. These logs help detect potentially unauthorised certificate issuance.

Impact on Indian services: MeitY described the impact on Indian websites and applications as very limited and confirmed that CCA-regulated DSC and eSign services remained unaffected.

The available disclosures did not establish that the compromised keys had been used to steal information. A vulnerability indicates the possibility of misuse, not proof of a successful attack. Blocking affected certificates reduces the risk but does not, by itself, establish that every potential security issue has been resolved.

Way Forward

Secure key generation: CAs should use reliable cryptographic randomness and regularly test their key-generation systems.

Continuous monitoring: Browser companies, regulators and website administrators should monitor certificate transparency logs and investigate suspicious certificate issuance.

Effective incident response: Vulnerable certificates should be promptly blocked or revoked and replaced where necessary. Independent security audits and timely disclosure can strengthen accountability.

User protection: Users and organisations should install security updates and avoid bypassing browser certificate warnings.

PYQ COMPASS

Q. What are the different elements of cyber security? Keeping in view the challenges in cyber security, examine the extent to which India has successfully developed a comprehensive National Cyber Security Strategy. (GS II - 2022)

PYQ Compass

Q. Consider the following statements: (2019)
A digital signature is:
1. An electronic record that identifies the certifying authority issuing it
2. Used to serve as a proof of identity of an individual to access information or server on Internet.
3. An electronic method of signing an electronic document and ensuring that the original content is unchanged.
Which of the statements given above is/are correct?
a) 1 only
b) 2 and 3 only
c) 3 only
d) 1, 2 and 3

Ans : C
1. An electronic record that identifies the certifying authority issuing it: This is Incorrect: A digital signature is not primarily an electronic record identifying the certifying authority. The certifying authority issues a digital certificate, which contains information about the public key and the certifying authority but is distinct from the digital signature itself.
2. Used to serve as a proof of identity of an individual to access information or server on Internet: This is Incorrect: A digital signature is not primarily used as proof of identity for accessing servers or information. Digital signatures are used to ensure the integrity and authenticity of electronic documents. Proof of identity online is typically achieved through other means, such as digital certificates or authentication methods.
3. An electronic method of signing an electronic document and ensuring that the original content is unchanged: This is Correct. A digital signature is used to verify that an electronic document has not been tampered with and to authenticate the sender. It provides integrity and non-repudiation by ensuring that the original content remains unchanged.

Q. Which one of the following pairs of States of India indicates the easternmost and westernmost State? (2015)
a) Assam and Rajasthan
b) Arunachal Pradesh and Rajasthan
c) Assam and Gujarat
d) Arunachal Pradesh and Gujarat

Ans : d
India's easternmost point lies in Arunachal Pradesh near Kibithu, which borders China and Myanmar. This makes Arunachal Pradesh the easternmost state. The westernmost point of India is in Gujarat, near the village of Guhar Moti in Kutch, bordering Pakistan. Among the given pairs, "Arunachal Pradesh and Gujarat" correctly represent the easternmost and westernmost states of India, making option (d) the correct answer.

PRACTICE QUESTIONS

Q. Consider the following statements regarding digital certificates and Internet security:

1. A vulnerability in an intermediate Certification Authority (CA) can potentially undermine the security of websites whose identities it certifies.
2. Digital certificates help browsers verify website identities and establish secure online connections.
3. The revocation of a compromised digital certificate necessarily establishes that the certificate was previously used to steal users' information.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

(a) 1 and 2 only

- Statement 1 is correct. A compromised intermediate CA may enable attackers to issue fraudulent certificates and impersonate legitimate websites.
- Statement 2 is correct. Digital certificates help authenticate website identities and support secure, encrypted communications.
- Statement 3 is incorrect. Revocation addresses the security risk posed by a compromised certificate. It does not, by itself, establish that the certificate was misused or that information was stolen.

Q. Consider the following statements regarding the Prix Pascal de Littérature IA:

1. It is an award introduced in France to recognise books co-written with Artificial Intelligence (AI).
2. It reflects the growing debate over authorship and literary recognition in the age of AI.
3. It is primarily intended to address copyright infringement arising from the use of books to train AI models.

Which of the statements given above is/are correct?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3
Answer: (a) 1 and 2 only

The Prix Pascal de Littérature IA recognises books co-written with AI, reflecting the emergence of AI-assisted literary production. It raises questions about authorship, creativity and the recognition of AI-assisted works. Copyright disputes over the use of books to train AI models form a related but distinct issue. However, the award is not primarily intended to resolve them.