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DAILY QUIZ — SOLVED

Daily Quiz — April 10, 2026

10 April 2026

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DAILY QUIZ — SOLVED ANSWER KEY

Daily Quiz — April 10, 2026

10 April 2026 · 24 Questions · Answers & Explanations Included

Question 1 of 24 Source →

Which technology forms the basis of the 1,000-km secure communication network demonstrated under India's National Quantum Mission?

A Post-Quantum Cryptography (PQC)

B Quantum Key Distribution (QKD) ✓

C Quantum Annealing

D Symmetric Lattice Encryption

ANSWER & ANALYSIS

EXPLANATION

FACT: India achieved a 1,000-km QKD network in April 2026 — developed by QNu Labs, Bengaluru. QKD uses photons to transmit cryptographic keys; any eavesdropping disturbs quantum state and is immediately detectable.
ANALYSIS: This distinguishes QKD from mathematical cryptography — its security rests on physics laws, not computational hardness.

CONCEPT NOTE

National Quantum Mission (NQM) was approved April 2023 with ₹6,003 crore outlay over 8 years (to 2031). It has four thematic hubs at IISc Bengaluru, IIT Bombay, IIT Madras, and IIT Delhi, covering four pillars: Quantum Computing, Quantum Communication, Quantum Sensing, and Quantum Materials.
The 1,000-km QKD network is a midpoint toward the 2,000-km national backbone target. China leads globally with a 12,000-km QKD backbone plus the Micius satellite (demonstrated 7,600-km China-Austria QKD in 2017).
India separately tracks Post-Quantum Cryptography (PQC) — a parallel approach using classical algorithms resistant to quantum attacks; NIST finalised PQC standards in 2024. The key distinction: QKD secures key distribution using physics; PQC secures data using mathematical hardness.

Q1 🎯 **CONCEPT KIT**

🔗 **CROSS-PAPER**	GS3 (S&T — quantum technology, NQM).
✍️ **MAINS KEYWORDS**	quantum key distribution, photon-based encryption, harvest-now-decrypt-later, strategic communications.
⚠️ **COMMON MISTAKE**	Confusing QKD with PQC — QKD is physics-based key distribution; PQC is classical algorithm-based encryption resistant to quantum attacks.
📌 **EXAM TIP**	UPSC 2023 Prelims had a question on National Quantum Mission — know the 4 pillars and 4 T-Hub locations.
🎤 **INTERVIEW**	Should India pursue QKD infrastructure given China's 16-year head start, or focus on PQC standardisation instead?

📰 Read Full Article →

Question 2 of 24 Source →

Consider the following statements about the Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA):

1. PESA extends the provisions of the 73rd Amendment verbatim to Fifth Schedule areas.
2. Under PESA, Gram Sabha consent is mandatory before land acquisition in Scheduled Areas.
3. PESA applies to all nine states having Fifth Schedule areas.

Which of the statements given above is/are correct?

A. 1 and 2 only

B. 2 only ✓

C. 2 and 3 only

D. 1, 2 and 3

ANSWER & ANALYSIS

EXPLANATION

FACT: Statement 1 is wrong — PESA does NOT extend 73rd Amendment verbatim; it adapts it with additional tribal protections (Gram Sabha supremacy, customary law recognition). Statement 2 is correct — Gram Sabha consent is mandatory for land acquisition.

Statement 3 is wrong — PESA applies to 10 states (not 9): AP, Chhattisgarh, Gujarat, HP, Jharkhand, Maharashtra, MP, Odisha, Rajasthan, Telangana.

CONCEPT NOTE

PESA (1996) was enacted to extend the spirit — not the letter — of the 73rd Amendment (1992) to Scheduled Fifth Schedule areas, while adding critical protections reflecting tribal customary governance. The 10 PESA states: Andhra Pradesh, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Maharashtra, Madhya Pradesh, Odisha, Rajasthan, Telangana (Telangana was bifurcated from AP in 2014 and inherited PESA coverage).

Key PESA provisions: Gram Sabha must safeguard tribal traditions; Gram Sabha must approve development plans; Gram Sabha must be consulted before land acquisition; State laws cannot be inconsistent with PESA. The Niyamgiri judgment (2013) — Orissa Mining Corp v. MoEF — held that Gram Sabhas of Dongria Kondh tribe had the right to decide on Vedanta's bauxite mine; all 12 voted against it. This is the landmark application of PESA in mining.

Q2 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (Polity — tribal governance, 73rd Amendment, Fifth Schedule), GS3 (Environment — mining, tribal rights).
✍️ MAINS KEYWORDS	PESA Gram Sabha supremacy, Niyamgiri precedent, Fifth Schedule, customary law.
⚠️ COMMON MISTAKE	Saying PESA applies to 9 states (forgetting Telangana, bifurcated from AP in 2014, which inherited PESA).
📌 EXAM TIP	UPSC 2019 Prelims asked about PESA — know it as adaptation of 73rd Amendment with additional tribal protections, not an extension of it.
🎤 INTERVIEW	Why have PESA implementation gaps persisted for 28 years despite clear constitutional mandates?

📰 Read Full Article →

Question 3 of 24 Source →

With reference to India's National Quantum Mission, which of the following pairs of Thematic Hub and Host Institution is **INCORRECTLY** matched?

A Quantum Computing — IIT Bombay

B **Quantum Communication — IISc Bengaluru** ✓

C Quantum Sensing — IIT Madras

D Quantum Materials — IIT Delhi

ANSWER & ANALYSIS

EXPLANATION

FACT: IISc Bengaluru hosts the Quantum Computing hub, NOT the Quantum Communication hub. IIT Bombay is incorrectly matched with Quantum Computing.

The four NQM T-Hubs are distributed across IISc Bengaluru (Computing), IIT Bombay (Communication), IIT Madras (Sensing/Metrology), and IIT Delhi (Materials). ANALYSIS: The placement reflects each institution's existing research strengths.

CONCEPT NOTE

NQM's four Thematic Hubs (T-Hubs): (1) Quantum Computing — IISc Bengaluru; (2) Quantum Communication — IIT Bombay (also leads QKD work in collaboration with QNu Labs); (3) Quantum Sensing and Metrology — IIT Madras; (4) Quantum Materials and Devices — IIT Delhi. These hubs coordinate national research, interface with industry, and train the next generation of quantum scientists.

QNu Labs (Bengaluru) is the private sector partner that developed and deployed the 1,000-km QKD network. QKD applications: secure government communications (military command, financial transfers), eventually protecting Aadhaar biometric transmissions.

China's Micius satellite (2016, operated by CAST) demonstrated satellite-based QKD at 7,600 km in 2017 — India's NQM targets a quantum satellite by 2031.

Q3 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (S&T — NQM, quantum technology, indigenisation).
✍️ MAINS KEYWORDS	National Quantum Mission, T-Hubs, QKD, quantum satellite, strategic communications.
⚠️ COMMON MISTAKE	Associating IIT Bombay with Quantum Computing — IISc Bengaluru leads that hub.
📌 EXAM TIP	NQM is a Tier-1 topic — know all 4 pillars + 4 T-Hubs for Prelims 2025.
🎤 INTERVIEW	Is India's 8-year NQM timeline realistic given China's decade-long head start in quantum infrastructure?

Read Full Article →

Question 4 of 24 Source →

Under the Nutrient Based Subsidy (NBS) scheme, which of the following fertilisers is/are covered?

1. Urea

2. Di-Ammonium Phosphate (DAP)

3. Muriate of Potash (MOP) Select the correct answer using the codes below:

A 1 only

B **2 and 3 only** ✓

C 1 and 3 only

D 1, 2 and 3

ANSWER & ANALYSIS

EXPLANATION

FACT: Urea is NOT covered under the NBS scheme — it has a separate flat-rate concession subsidy with MRP fixed at ₹242/bag (unchanged since 2012). NBS covers 24 grades of phosphatic (P) and potassic (K) fertilisers including DAP and MOP. For Kharif 2026, the Cabinet approved ₹41,534 crore NBS subsidy for P&K fertilisers.

CONCEPT NOTE

NBS scheme was launched in April 2010 to replace the earlier flat product-based subsidy for P&K fertilisers with a nutrient-based model — paying a fixed subsidy per kg of nutrient (N, P, K, S) to manufacturers, allowing market-linked pricing. Urea remains outside NBS due to political sensitivity — its price has been frozen at ₹242/bag since 2012 despite production costs of ₹1,200+ per bag.

This creates a massive NPK imbalance: ideal NPK ratio is 4:2:1 but actual usage is approximately 8-9:3:1 (nitrogen-heavy) because urea is dramatically cheaper. Consequences: soil acidification, declining organic carbon, groundwater nitrate contamination, declining yields despite higher inputs.

India imports ~50% of DAP from Saudi Arabia, China, Jordan; ~100% of MOP from Canada, Belarus, Russia — making P&K supply vulnerable to geopolitical disruptions.

Q4 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (Agriculture — fertiliser policy, soil health, food security).
✍️ MAINS KEYWORDS	NBS scheme, NPK imbalance, urea subsidy, fertiliser import dependence, soil health.
⚠️ COMMON MISTAKE	Including urea under NBS — urea has a completely separate subsidy mechanism (MRP fixed + full cost reimbursement to manufacturers).
📌 EXAM TIP	UPSC 2022 asked about NBS scheme — know it covers P&K (not urea) and was launched in 2010.
🎤 INTERVIEW	Despite NBS, India's NPK imbalance persists — is the real solution DBT for fertilisers or urea pricing reform?

📰 Read Full Article →

Question 5 of 24 Source →

ASSERTION (A)

Nominated members of the Rajya Sabha cannot vote in the Presidential election.

REASON (R)

The President of India is elected by an electoral college consisting exclusively of elected representatives of the people.

A **Both A and R are true and R is the correct explanation of A ✓**

B Both A and R are true but R is NOT the correct explanation of A

C A is true but R is false

D A is false but R is true

ANSWER & ANALYSIS

EXPLANATION

FACT: Both A and R are correct and R explains A. Article 55 defines the Presidential electoral college as elected members of both Houses of Parliament and elected members of state legislative assemblies — nominated members, who represent no electorate, are explicitly excluded. Nominated RS members CAN vote in VP elections and RS proceedings, but NOT in Presidential elections.

CONCEPT NOTE

Article 80(1)(a) empowers the President to nominate 12 Rajya Sabha members with expertise in literature, science, art, or social service. Harivansh Narayan Singh (former RS Deputy Chairman, journalist-Prabhat Khabar) was nominated April 10, 2026, filling the vacancy after former CJI Ranjan Gogoi's tenure ended.

Nominated members' voting rights: Can vote on bills (including Constitution Amendment Bills); can vote in Vice Presidential election (Article 66 — elected by members of both Houses); CANNOT vote in Presidential election (Article 55 — electoral college = elected MPs + elected MLAs only). The 104th Amendment (2019) abolished nominated Anglo-Indian seats in Lok Sabha (earlier 2 seats under Article 331) and state assemblies.

Rajya Sabha total: 245 = 233 elected + 12 nominated.

Q5 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (Polity — Parliament, Rajya Sabha composition, Presidential election).
✍️ MAINS KEYWORDS	Article 80, Article 55, electoral college, nominated members, Rajya Sabha powers.
⚠️ COMMON MISTAKE	Saying nominated RS members cannot vote in any election — they CAN vote in VP election but not Presidential election.
📌 EXAM TIP	UPSC Prelims has repeatedly tested Article 80 and Article 55 distinctions — know exactly who is in the Presidential electoral college.
🎤 INTERVIEW	Does the nominated Rajya Sabha category serve its constitutional purpose of bringing expertise into Parliament, or has it become a political instrument?

📰 Read Full Article →

Question 6 of 24 Source →

Consider the following statements about the 16th Finance Commission's allocation to Rural Local Bodies: 1. 90% of the RLB allocation goes to Gram Panchayats and 10% to Block and District Panchayats.

2. The 16th Finance Commission is chaired by Dr. Arvind Panagariya.
3. Under Article 243I, the State Finance Commission is constituted every three years.

Which of the statements given above is/are correct?

A **1 and 2 only ✓**

B 2 and 3 only

C 1 only

D 1, 2 and 3

ANSWER & ANALYSIS

EXPLANATION

FACT: Statements 1 and 2 are correct — 90% to Gram Panchayats, 10% to Block/District PRIs; Dr. Arvind Panagariya chairs the 16th FC. Statement 3 is wrong — Article 243I requires State Finance Commissions to be constituted every FIVE years (not three), mirroring the Central Finance Commission cycle under Article 280.

CONCEPT NOTE

The 16th Finance Commission (2026–27 to 2030–31) allocated ₹4.35 lakh crore to rural local bodies — up from the 15th FC's ₹2.97 lakh crore recommended (₹2.82 lakh crore released, efficiency 94.94%). States with 100% 15th FC utilisation: Assam, Kerala, Mizoram, Tripura, Uttar Pradesh.

Peak year allocation: ₹1,13,558 crore (2030–31). Article 243G (11th Schedule): Lists 29 subjects for Panchayat functions — but devolution is enabling, not mandatory; states differ widely in actual delegation.

Article 243H: Panchayat taxation powers. Article 280: Central Finance Commission — every 5 years.

Article 243I: State Finance Commission — every 5 years. The difference from Gram Panchayat's own revenue: typically less than 5% of total receipts — FC grants and Central/State scheme transfers dominate.

Q6 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (Polity — fiscal federalism, Panchayati Raj, Finance Commission).
✍️ MAINS KEYWORDS	16th Finance Commission, Article 243G, Article 243I, untied grants, fiscal decentralisation.
⚠️ COMMON MISTAKE	Saying Article 243I mandates 3-year SFC cycle — it is 5 years, same as Central Finance Commission.
📌 EXAM TIP	UPSC 2021 had a question linking Finance Commission grants to Panchayats — know Articles 243G, 243H, and 243I precisely.
🎤 INTERVIEW	Why do Finance Commission grants not translate into genuine Panchayat self-governance given most panchayats lack trained staff and audit systems?

📰 Read Full Article →

Question 7 of 24 Source →

Match List I (Military Exercise) with List II (Partner Nation) and select the correct answer:

LIST I	LIST II

A **A-3, B-1, C-4, D-2** ✓

B A-2, B-3, C-1, D-4

C A-3, B-2, C-4, D-1

D A-1, B-3, C-2, D-4

ANSWER & ANALYSIS

EXPLANATION

FACT: Cyclone — Egypt; Yudh Abhyas — USA; Indra — Russia; Shakti — France. These are established bilateral military exercise series.
Exercise Cyclone-IV (India-Egypt, April 2026) is the 4th edition of the special forces exercise series. ANALYSIS: India's 80+ annual bilateral exercises are a key instrument of defence diplomacy.

CONCEPT NOTE

India's key bilateral military exercises by domain: Army: Yudh Abhyas (USA), Indra (Russia), Shakti (France), Tasman Saber (Australia), Mitra Shakti (Sri Lanka), Surya Kiran (Nepal), Bold Kurukshetra (Singapore), Cyclone (Egypt), Sada Al-Janub (Saudi Arabia). Navy: Malabar (USA+Japan+Australia), Varuna (France), Konkan (UK), IBSAMAR (India-Brazil-South Africa), JIMEX (Japan).
Air Force: Cope India (USA), Garuda (France), Desert Eagle (UAE), Tasman Saber (Australia). Special Forces: Vajra Prahar (USA-SF), Ekuverin (Maldives).
Exercise Brahmastra (Pokhran, April 2026) showcased Apache AH-64E — 22 helicopters procured via FMS from USA (2019-20). Apache's primary weapon: AGM-114 Hellfire anti-tank missile.
Pokhran: Site of nuclear tests Pokhran-I (1974, Smiling Buddha) and Pokhran-II (1998, Operation Shakti, 5 devices).

Q7 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (IR — India's defence partnerships), GS3 (Security — military exercises, India's defence modernisation).
✍️ MAINS KEYWORDS	defence diplomacy, military exercises, multi-alignment, FMS procurement.
⚠️ COMMON MISTAKE	Confusing Exercise Shakti (France-Army) with Exercise Garuda (France-Air Force) — both are India-France but different services.
📌 EXAM TIP	UPSC Prelims frequently asks exercise-nation pairs — maintain a current list.
🎤 INTERVIEW	Do India's 80+ annual bilateral exercises translate into genuine interoperability, or are they primarily diplomatic theatre?

📰 Read Full Article →

Question 8 of 24 Source →

The Sijimali bauxite conflict in Odisha involves Vedanta Limited's proposed mine. Which of the following is the correct sequence of bauxite processing into aluminium?

A Bauxite → Hall-Héroult process → Alumina → Bayer process → Aluminium

B Bauxite → Bayer process → Alumina → Hall-Héroult electrolysis → Aluminium ✓

C Bauxite → Bayer process → Aluminium → Hall-Héroult process → Alumina

D Bauxite → Smelting → Alumina → Electrolysis → Aluminium

ANSWER & ANALYSIS

EXPLANATION

FACT: The correct sequence is Bauxite → Bayer Process (chemical extraction using NaOH) → Alumina (Al_2O_3) → Hall-Héroult electrolysis (molten cryolite bath) → Aluminium metal. India's aluminium majors (NALCO, Vedanta, Hindalco) all follow this two-stage process.

ANALYSIS: Aluminium smelting is extremely energy-intensive — it accounts for 3-4% of global electricity consumption.

CONCEPT NOTE

Bayer Process (1887, Karl Bayer): Bauxite is treated with hot caustic soda (NaOH) under high pressure — aluminium hydroxide is precipitated and calcined to alumina (Al_2O_3). Hall-Héroult Process (1886, independently by Charles Hall and Paul Héroult): Alumina is dissolved in molten cryolite (Na_3AlF_6) at ~960°C and electrolysed — aluminium deposits at cathode.

Energy intensity: ~15 kWh per kg of aluminium — making cheap electricity the key competitive factor. India's aluminium sector: NALCO (Odisha — largest PSU; refinery at Damanjodi, smelter at Angul), Vedanta (Lanjigarh refinery, Jharsuguda smelter), Hindalco (Renukoot, UP).

Odisha: 41% of India's bauxite reserves; 73% of production. Bauxite critical uses: aluminium (packaging, automotive, aerospace, EVs), refractory materials, abrasives, aluminium sulphate (water treatment).

Q8 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (Economy — critical minerals, industrial processes; Environment — bauxite mining, tribal rights).
✍️ MAINS KEYWORDS	Bayer process, Hall-Héroult electrolysis, aluminium value chain, PESA, Niyamgiri precedent.
⚠️ COMMON MISTAKE	Reversing Bayer and Hall-Héroult — Bayer comes first (produces alumina FROM bauxite), Hall-Héroult comes second (produces aluminium FROM alumina).
📌 EXAM TIP	Industrial process sequences appear in UPSC Prelims GS3 — know Bayer-Hall-Héroult for aluminium and Bessemer-BOF for steel.
🎤 INTERVIEW	Should India prioritise aluminium self-sufficiency even if it requires overriding tribal community rights to bauxite-bearing forests?

📰 Read Full Article →

Question 9 of 24 Source →

Consider the following statements about Rajya Sabha:

1 Article 249 empowers Rajya Sabha to pass a resolution authorising Parliament to legislate on a State List subject by a simple majority.

2 Article 312 allows Rajya Sabha to create new All India Services by a resolution passed by two-thirds majority.

3 Rajya Sabha can be dissolved by the President under Article 85.

Which of the statements given above is/are correct?

A **2 only ✓**

B 1 and 2 only

C 2 and 3 only

D 1, 2 and 3

ANSWER & ANALYSIS

EXPLANATION

FACT: Statement 1 is wrong — Article 249 requires a special majority (not simple majority) — 2/3 of members present and voting. Statement 2 is correct — Article 312 requires 2/3 majority for new All India Services. Statement 3 is wrong — Rajya Sabha is a permanent House (Article 83); it CANNOT be dissolved; only Lok Sabha can be dissolved under Article 85.

CONCEPT NOTE

Rajya Sabha's two exclusive federal powers: (1) Article 249: RS can resolve (2/3 majority of members present and voting) that it is necessary for Parliament to legislate on a State List subject in national interest — Parliament can then legislate for 1 year (renewable). (2) Article 312: RS can resolve (2/3 majority) that it is necessary in national interest to create new All India Services — Parliament can then by law create such services. Indian Forest Service (IFS) was created under Article 312 in 1966.

Rajya Sabha permanent House under Article 83(1): cannot be dissolved; 1/3 of members retire every 2 years; each member has 6-year term. The Indian Police Service (IPS) and Indian Administrative Service (IAS) predate the Constitution — they were created under Part XIV of the Constitution (Articles 308-323).

Harivansh Narayan Singh was formerly RS Deputy Chairman — Article 90 (elected by RS members).

Q9 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (Polity — Parliament, Rajya Sabha powers, federalism).
✍️ MAINS KEYWORDS	Article 249, Article 312, permanent House, All India Services, federal safeguard.
⚠️ COMMON MISTAKE	Saying Article 249 requires simple majority — it requires 2/3 of members present and voting (special majority).
📌 EXAM TIP	UPSC repeatedly tests Rajya Sabha's special powers — Article 249 (State List legislation) and Article 312 (new AIS) are the two unique RS powers.
🎤 INTERVIEW	Is Rajya Sabha's role as a federal check becoming weaker as parties with national majorities control both Houses simultaneously?

📰 Read Full Article →

Question 10 of 24 Source →

ASSERTION (A)

India's Prototype Fast Breeder Reactor (PFBR) at Kalpakkam uses liquid sodium as coolant instead of water.

REASON (R)

Sodium does not moderate (slow down) neutrons, which is essential for maintaining fast neutron fission in a breeder reactor.

A **Both A and R are true and R is the correct explanation of A ✓**

B Both A and R are true but R is NOT the correct explanation of A

C A is true but R is false

D A is false but R is true

ANSWER & ANALYSIS

EXPLANATION

FACT: Both A and R are correct and R correctly explains A. The PFBR at Kalpakkam is a sodium-cooled fast reactor — sodium is used precisely because it does not thermalise (slow) neutrons. Fast neutrons are needed to fission U-238 (breed Pu-239) and sustain the breeder cycle.

Water would slow neutrons to thermal speeds, defeating the purpose. ANALYSIS: Sodium's low neutron moderation is the primary reason it is chosen despite being more chemically reactive than water.

CONCEPT NOTE

PFBR key parameters: 500 MWe; sodium-cooled; fuel: MOX (mixed oxide of U-238 + Pu-239); blanket: U-238 (breeds Pu-239) and Th-232 (breeds U-233 for Stage 3); built by BHAVINI (Bharatiya Nabhikiya Vidyut Nigam Ltd) under DAE; location: IGCAR campus, Kalpakkam, Tamil Nadu; first criticality achieved: April 2024 (16 years behind 2010 schedule). Breeding ratio >1 means more fuel produced than consumed.

Sodium properties relevant to FBR: (1) does not moderate neutrons (essential for fast neutron cycle); (2) excellent heat transfer properties; (3) operates at atmospheric pressure (vs high pressure in water-cooled reactors). Sodium risks: (1) reacts violently with water (sodium fire risk — special containment needed); (2) becomes radioactive (Na-24) when irradiated.

AERB (Atomic Energy Regulatory Board) provides safety oversight — but its independence from DAE is a structural governance concern.

Q10 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (S&T — nuclear energy, three-stage programme).
✍️ MAINS KEYWORDS	fast breeder reactor, sodium-cooled, breeding ratio, three-stage nuclear programme, BHAVINI.
⚠️ COMMON MISTAKE	Saying water is unsuitable for FBR because it is corrosive — the real reason is neutron moderation (water slows neutrons, defeating the fast neutron cycle).
📌 EXAM TIP	UPSC 2019 and 2022 both asked about PFBR and three-stage nuclear programme — know why sodium is used.
🎤 INTERVIEW	After a 16-year delay and massive cost overrun, does PFBR's eventual criticality justify India's institutional model of DAE-controlled nuclear development?

📰 Read Full Article →

Question 11 of 24 Source →

Which of the following best describes the 'Continuous At-Sea Deterrence' (CASD) posture?

A **Maintaining at least one nuclear-armed submarine on patrol at all times to ensure survivable second-strike capability** ✓

B Maintaining continuous air patrols of nuclear-armed aircraft to ensure rapid first-strike capability

C Positioning nuclear ballistic missiles in hardened silos across dispersed locations to prevent total destruction in a first strike

D Conducting continuous electronic monitoring of adversary nuclear movements via satellite constellation

ANSWER & ANALYSIS

EXPLANATION

FACT: CASD requires at least one nuclear-armed SSBN (ballistic missile submarine) on patrol at all times — ensuring that nuclear weapons are always at sea, immune to a pre-emptive first strike. The UK has maintained unbroken CASD since 1968 (Operation Relentless).
India achieved its first deterrent patrol in 2018 with INS Arihant. ANALYSIS: CASD makes a No First Use doctrine credible — if land forces are destroyed, submarine survives to retaliate.

CONCEPT NOTE

CASD requires a minimum of 4-5 SSBNs to maintain one permanently at sea (accounting for refit, maintenance, crew rotation cycles). India's SSBN fleet: INS Arihant (commissioned 2016, 6,000 tonnes) + INS Arighat (commissioned August 2024) + S4 class under construction (13,500 tonnes, ICBM-range missiles).
India's K-series SLBMs: K-15 Sagarika (750 km range), K-4 (3,500 km), K-5/K-6 (under development, ICBM range). ATV Programme: India's classified SSBN development programme — Navy + DRDO + DAE; construction at Ship Building Centre, Visakhapatnam.
Large Cavitation Tunnel (LCT) at NSTL Visakhapatnam: enabled hydrodynamic testing for SSBN hull and propeller design.
India is one of six nations with SSBNs: USA, Russia, UK, France, China, India.
India's nuclear doctrine: No First Use (NFU) + credible minimum deterrence — CASD provides the operational foundation for credible NFU.

Q11 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (Security — nuclear doctrine, nuclear triad, ATV programme), GS2 (IR — India's nuclear posture).
✍️ MAINS KEYWORDS	CASD, SSBN, No First Use, nuclear triad, ATV programme, deterrence.
⚠️ COMMON MISTAKE	Confusing CASD with continuous air patrols (nuclear bombers) — CASD specifically refers to submarine-based deterrence.
📌 EXAM TIP	UPSC 2023 asked about India's nuclear doctrine components — know NFU + credible minimum deterrence + CASD as the operational expression.
🎤 INTERVIEW	With only 2 commissioned SSBNs, does India have genuine CASD capability or merely symbolic sea-based deterrence?

📰 Read Full Article →

Question 12 of 24 Source →

Which of the following Union Territories has a legislature under Article 239A of the Constitution?

A Lakshadweep

B Dadra and Nagar Haveli and Daman and Diu

C **Puducherry ✓**

D Chandigarh

ANSWER & ANALYSIS

EXPLANATION

FACT: Article 239A applies to Puducherry — it is the Union Territory with a legislature under this provision. Lakshadweep, Dadra & NH & Daman & Diu, and Chandigarh are UTs without legislatures.
Delhi (NCT) has a legislature under the separate Article 239AA, which gives it broader (but still limited) statehood-like powers. J&K has a legislature under Article 239AA (post-2019 reorganisation).

CONCEPT NOTE

Union Territories classification: UTs with legislature: (1) Puducherry — Article 239A (legislature + CM + Council of Ministers; LG as head); (2) Delhi (NCT) — Article 239AA (broader powers than 239A; Lieutenant Governor has significant concurrent powers; multiple SC judgments on LG vs elected govt friction); (3) Jammu & Kashmir — Article 239AA (post J&K Reorganisation Act 2019; previously a full state under Article 370). UTs without legislature: Andaman & Nicobar Islands, Chandigarh, Dadra & NH & Daman & Diu, Lakshadweep, Ladakh.
Each UT is administered by an Administrator/Lieutenant Governor appointed by the President under Article 239.
Puducherry elections 2026: AINRC-BJP vs Congress-DMK alliance; 30 assembly seats; turnout 89.87%; results May 4, 2026.

Q12 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (Polity — Union Territories, Centre-UT relations, Article 239A/239AA).
✍️ MAINS KEYWORDS	Article 239A, Article 239AA, Lieutenant Governor powers, Puducherry governance, Delhi governance paradox.
⚠️ COMMON MISTAKE	Confusing Article 239A (Puducherry) with Article 239AA (Delhi, J&K) — 239AA gives broader quasi-statehood powers than 239A.
📌 EXAM TIP	UPSC Prelims 2016 asked about UTs with legislatures — know all three (Puducherry-239A; Delhi, J&K-239AA).
🎤 INTERVIEW	Should Puducherry be granted full statehood given its elected government functions like a state but lacks statehood protections?

📰 Read Full Article →

Question 13 of 24 Source →

Consider the following statements about Quantum Key Distribution (QKD):

1. QKD's security is based on the computational hardness of factoring large prime numbers.
2. Any attempt to intercept a QKD photon stream alters the quantum state, making eavesdropping immediately detectable.
3. Post-Quantum Cryptography (PQC) and QKD are the same technology described differently.

Which of the statements given above is/are correct?

A. **2 only ✓**

B. 1 and 2 only

C. 1 and 3 only

D. 1, 2 and 3

ANSWER & ANALYSIS

EXPLANATION

FACT: Statement 1 is wrong — QKD security rests on the laws of quantum mechanics (observing a quantum state disturbs it), NOT mathematical hardness. Classical encryption (RSA) uses prime factoring.
Statement 2 is correct — this is the fundamental QKD security principle. Statement 3 is wrong — PQC and QKD are distinct approaches; PQC uses classical algorithms resistant to quantum attacks while QKD uses quantum physics for key distribution.

CONCEPT NOTE

QKD vs PQC comparison: QKD — uses quantum photons to distribute encryption keys; security from physics (any measurement disturbs quantum state); requires dedicated quantum communication infrastructure (optical fibre or satellite); currently limited range without quantum repeaters. PQC (Post-Quantum Cryptography) — uses classical mathematical algorithms that are believed to resist both classical and quantum computer attacks; NIST finalised PQC standards in 2024 (CRYSTALS-Kyber for key encapsulation, CRYSTALS-Dilithium for digital signatures); can run on existing infrastructure. India pursues both: NQM for QKD infrastructure, and DST has a separate PQC standardisation initiative. The 'harvest now, decrypt later' threat: adversaries are already storing encrypted data today (government cables, financial transactions, Aadhaar transmissions) hoping to decrypt them when quantum computers mature — estimated 10-15 years away.

Q13 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (S&T — quantum technology, cryptography, cyber security).
✍️ MAINS KEYWORDS	QKD, post-quantum cryptography, NIST PQC standards, quantum-safe communications, NQM.
⚠️ COMMON MISTAKE	Thinking QKD security is based on mathematical complexity — it is based on quantum physics (Heisenberg uncertainty principle / no-cloning theorem).
📌 EXAM TIP	UPSC 2024 had a science question on quantum communication — distinguish QKD (physics-based) from PQC (maths-based).
🎤 INTERVIEW	Given QKD's infrastructure requirements, should India prioritise PQC (deployable on existing networks) over QKD for near-term cyber security?

📰 Read Full Article →

Question 14 of 24 Source →

The Niyamgiri judgment (2013) is a landmark ruling related to which of the following issues?

A Gram Sabha consent for forest diversion under the Forest Conservation Act

B **Gram Sabha rights to reject mining proposals in Scheduled Areas under PESA and Forest Rights Act ✓**

C Supreme Court's authority to review environmental clearances granted by MoEFCC

D Compensation norms under the Land Acquisition Act for tribal communities

ANSWER & ANALYSIS

EXPLANATION

FACT: The Orissa Mining Corp v. Ministry of Environment (2013) — Niyamgiri case — held that Gram Sabhas of the Dongria Kondh tribe had the statutory right (under PESA and FRA) to decide whether Vedanta's bauxite mine could proceed on Niyamgiri hills. All 12 Gram Sabhas voted against the mine.
ANALYSIS: This established Gram Sabha decisions on mining as legally binding, not merely advisory.

CONCEPT NOTE

Niyamgiri facts: Location — Niyamgiri hills, Kalahandi-Rayagada, Odisha (Eastern Ghats). Tribe — Dongria Kondh (considered Niyam Raja their deity residing on the hill).
Company — Vedanta Resources (UK-listed; Lanjigarh refinery 5 MTPA capacity at the foot of the hills). Stage-2 forest clearance was pending — Supreme Court directed 12 Gram Sabhas to convene and decide.
All 12 Gram Sabhas (2013) unanimously rejected the mine — Stage-2 clearance was refused. Significance: (1) First time SC referred a mining decision to tribal Gram Sabhas; (2) Established that FRA community rights + PESA Gram Sabha authority together constitute a community veto on forest mining; (3) Vedanta had to abandon the mine.
The Sijimali conflict (2026) directly invokes this precedent — tribals allege Gram Sabha approvals obtained by fraud, seeking court intervention.

Q14 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (Polity — PESA, tribal rights, SC judgment), GS3 (Environment — forest rights, mining governance).
✍️ MAINS KEYWORDS	Niyamgiri judgment, Dongria Kondh, Gram Sabha veto, FRA community rights, PESA Section 4.
⚠️ COMMON MISTAKE	Saying Niyamgiri was decided under Forest Conservation Act — the key legal basis was PESA + FRA (not FCA).
📌 EXAM TIP	Niyamgiri appears in UPSC Ethics paper as a case study on balancing development with community rights — know all facts (tribe name, mountain, company, 12 Gram Sabhas, unanimous rejection).
🎤 INTERVIEW	Does the Niyamgiri precedent create a workable framework for mining governance in tribal areas, or does it give an effective veto that makes mineral development impossible?

📰 Read Full Article →

Question 15 of 24 Source →

Match List I (Rajya Sabha provision) with List II (Constitutional Article) and select the correct answer:

LIST I	LIST II

A. A-4, B-2, C-1, D-3 ✓

B. A-2, B-4, C-3, D-1

C. A-4, B-3, C-2, D-1

D. A-3, B-2, C-4, D-1

ANSWER & ANALYSIS

EXPLANATION

FACT: Parliament can legislate on State List in national interest (with 2/3 RS majority) — Article 249; Rajya Sabha composition (nominated + elected) — Article 80; Creation of new All India Services (2/3 RS majority) — Article 312; Gram Sabha — Article 243A. These are foundational constitutional provisions tested repeatedly in UPSC Prelims.

CONCEPT NOTE

Rajya Sabha's special constitutional provisions: Article 80 — Composition (245 total = 233 elected + 12 nominated); Article 249 — RS can authorise Parliament to legislate on State List (2/3 majority; valid 1 year, renewable; passed to address Coelho case aftermath); Article 312 — RS can authorise creation of new All India Services (2/3 majority; IFS created 1966 under this provision); Article 83 — RS is permanent house (cannot be dissolved). Other key RS articles: Article 89 (VP as ex-officio Chairman), Article 90 (Deputy Chairman elected by RS members).

Gram Sabha: Article 243A (Part IX — The Panchayats). All India Services: IAS, IPS, IFS (created 1966) — under Article 312.

Central Services: UPSC-recruited services like IRS, IFS (Foreign), Indian Railway Services etc. — not under Article 312.

Q15 🎯 **CONCEPT KIT**

🔗 **CROSS-PAPER**	GS2 (Polity — Parliament, Rajya Sabha, Panchayati Raj).
✍️ **MAINS KEYWORDS**	Article 80, Article 249, Article 312, Rajya Sabha federal safeguard.
⚠️ **COMMON MISTAKE**	Confusing Article 312 (new All India Services via RS resolution) with Article 309 (Parliament can regulate services of Union) — 312 requires RS special majority; 309 is ordinary legislation.
📌 **EXAM TIP**	Article 249 vs 312 is a classic UPSC comparison — both require 2/3 RS majority but for different purposes (State List legislation vs new AIS).
🎤 **INTERVIEW**	Given most parties now have national presence, is Rajya Sabha's role as a federal check still meaningful?

📰 Read Full Article →

Question 16 of 24 Source →

Consider the following statements about India's assembly elections in April 2026:

1. Puducherry has a legislature under Article 239AA of the Constitution.
2. The LDF under Pinarayi Vijayan won back-to-back assembly elections for the first time in Kerala's post-Independence history in 2021.
3. Assam has 126 assembly seats, making it one of the smaller legislative assemblies.

Which of the statements given above are correct?

A **2 and 3 only** ✓

B 1 and 2 only

C 1, 2 and 3

D 3 only

ANSWER & ANALYSIS

EXPLANATION

FACT: Statement 1 is wrong — Puducherry has a legislature under Article 239A (not 239AA). Article 239AA applies to Delhi and J&K. Statement 2 is correct — LDF's 2021 win broke the LDF-UDF alternation pattern that had held since 1980.

Statement 3 is correct — Assam has 126 seats; Article 170 sets minimum 60 and maximum 500 seats for state assemblies.

CONCEPT NOTE

Article 239A vs Article 239AA: Article 239A (Puducherry) — creates a legislature for the UT; Lieutenant Governor heads administration; CM + Council of Ministers responsible to legislature but LG retains concurrent executive powers. Article 239AA (Delhi, J&K) — confers broader legislative powers including on subjects in State List (with exceptions for land, police, public order which remain with Centre/LG).

Kerala's political history: Since 1980, LDF and UDF alternated in power every 5 years without exception — until 2021 when LDF under Pinarayi Vijayan won back-to-back (2016 + 2021). 2026 election tests whether this represents a structural political shift or whether the alternation pattern reasserts itself. Assam: 126 assembly seats; BJP-led NDA holds government; CM Himanta Biswa Sarma.

Key Assam issues: NRC (2019 final list excluded ~19 lakh), CAA 2019, APSC recruitment irregularities, floods, tea garden workers.

Q16 🎯 **CONCEPT KIT**

🔗 CROSS-PAPER	GS2 (Polity — UT governance, election analysis, legislative assemblies).
✍️ MAINS KEYWORDS	Article 239A, Article 239AA, LDF-UDF alternation pattern, Kerala politics, Assam NRC.
⚠️ COMMON MISTAKE	Saying Puducherry is governed under Article 239AA (like Delhi) — Puducherry is Article 239A, which gives narrower legislative powers than Delhi's 239AA.
📌 EXAM TIP	Article 239AA vs 239A appears frequently — know the distinction: 239AA gives quasi-statehood; 239A is a lighter version for Puducherry.
🎤 INTERVIEW	Is the LDF's Kerala model of high social spending sustainable given Kerala's rising debt/GSDP ratio (~38%)?

📰 Read Full Article →

Question 17 of 24 Source →

Which of the following statements about India's NPK fertiliser imbalance is **INCORRECT**?

A. The ideal NPK ratio for soil health is approximately 4:2:1 (N:P:K)

B. India's urea MRP has been fixed at ₹242 per 45-kg bag since 2012

C. **The Nutrient Based Subsidy scheme covers both urea and phosphatic fertilisers** ✓

D. India imports nearly 100% of its Muriate of Potash (MOP) requirement

ANSWER & ANALYSIS

EXPLANATION

FACT: Statement C is incorrect — the NBS scheme covers only phosphatic (P) and potassic (K) fertilisers. Urea is outside NBS and has a separate flat-rate subsidy mechanism with MRP fixed at ₹242/bag.
This is the structural root cause of India's NPK imbalance — urea (nitrogen) is dramatically cheaper than P&K fertilisers. ANALYSIS: All other statements are factually correct.

CONCEPT NOTE

India's NPK imbalance: Ideal 4:2:1 (N:P:K) vs actual ~8-9:3:1. Root cause: Price gap between subsidised urea (₹242/bag, unchanged since 2012) and subsidised DAP (₹1,350/bag).
Consequences: Soil acidification, declining organic carbon, nitrate leaching into groundwater, declining factor productivity (more inputs needed per unit output). Import profile: DAP — ~50% from Saudi Arabia, China, Jordan; MOP — ~100% (India has no potash reserves; imports from Canada, Belarus, Russia).
Fertiliser subsidy in Union Budget: ₹1.64 lakh crore (2025-26) — one of India's largest fiscal commitments. NBS launched 2010 specifically to correct NPK imbalance by allowing P&K prices to be market-linked with fixed per-nutrient subsidy.
Related schemes: Soil Health Card Scheme (2015); PM PRANAM (promotes alternative fertilisers); Nano Urea by IFFCO (liquid format, 500 ml).

Q17 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (Agriculture — fertiliser policy, soil health, food security, fiscal burden).
✍️ MAINS KEYWORDS	NBS scheme, NPK imbalance, urea pricing, soil health, import dependence.
⚠️ COMMON MISTAKE	Including urea in NBS — urea has a completely separate subsidy structure (flat concession scheme, not NBS).
📌 EXAM TIP	UPSC 2022 asked about NBS scheme — negative question format is common: 'Which is NOT covered?' Answer: Urea.
🎤 INTERVIEW	Can India achieve balanced NPK use without politically difficult urea price reform?

📰 Read Full Article →

Question 18 of 24 Source →

Consider the following statements about the Forest Rights Act, 2006:

1. Community Forest Rights (CFR) under FRA empower tribal communities to manage and protect community forest resources.
2. The FRA requires settlement of individual forest rights before land acquisition in scheduled tribal areas.
3. The FRA applies exclusively to Scheduled Tribes — other traditional forest dwellers are not covered.

Which of the statements given above is/are correct?

A. **1 and 2 only ✓**

B. 2 and 3 only

C. 1 only

D. 1, 2 and 3

ANSWER & ANALYSIS

EXPLANATION

FACT: Statement 1 is correct — CFR empowers communities to manage, protect, and use community forest resources. Statement 2 is correct — IFR (Individual Forest Rights) must be settled before acquisition.
Statement 3 is WRONG — FRA covers not just Scheduled Tribes but also 'other traditional forest dwellers' — non-tribal communities who have resided in forests for 75 years or more. The full name is the Scheduled Tribes and Other Traditional Forest Dwellers Act.

CONCEPT NOTE

FRA (2006) formal name: Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. Two main categories of rights: (1) Individual Forest Rights (IFR) — recognition of homestead and cultivation land rights (up to 4 hectares) of forest-dwelling families; (2) Community Forest Rights (CFR) — rights to manage, protect, regenerate, and use community forest resources (timber, NTFP, grazing grounds, sacred groves, water bodies).
Other Traditional Forest Dwellers (OTFD): non-ST communities who have been residing in forests for 75+ years prior to December 13, 2005 — must prove continuous residence for 3 generations. Gram Sabha is the authority for receiving, consolidating, verifying, and approving claims under FRA. FRA amendment: Proposed to include forest-dwelling pastoralists; pending.
Key Supreme Court case: Wildlife First v. Union of India (2019) — SC initially ordered eviction of 11.8 lakh encroachments but stayed the order after MoTA intervention.

Q18 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (Polity — tribal rights, PESA, FRA), GS3 (Environment — forest governance, conservation vs rights).
✍️ MAINS KEYWORDS	FRA 2006, Individual Forest Rights, Community Forest Rights, other traditional forest dwellers, Gram Sabha authority.
⚠️ COMMON MISTAKE	Saying FRA covers only Scheduled Tribes — the full title includes 'other traditional forest dwellers'; non-tribals with 75+ year forest residence are also covered.
📌 EXAM TIP	UPSC has repeatedly asked FRA questions — always check: 'only ST' is usually wrong because OTFDs are included.
🎤 INTERVIEW	Is FRA effective in protecting tribal forest rights or has its implementation been captured by forest bureaucracy?

📰 Read Full Article →

Question 19 of 24 Source →

With reference to Boeing AH-64E Apache helicopters in the Indian Army, which of the following is **NOT** correct?

A India procured 22 Apache helicopters through the Foreign Military Sales (FMS) route from the USA

B The Apache's primary anti-armour weapon is the AGM-114 Hellfire missile

C Apache helicopters were inducted into the Indian Army in 2019–20

D **India's Apache fleet is operated exclusively by the Indian Air Force ✓**

ANSWER & ANALYSIS

EXPLANATION

FACT: Statement D is incorrect — India's Apache helicopters are operated by the Indian Army (16 helicopters) and Indian Navy (6 helicopters) — NOT exclusively by the Indian Air Force. While India also has IAF attack helicopters (HAL Rudra), the Boeing Apache fleet belongs to the Army and Navy.
All other statements are factually correct.

CONCEPT NOTE

Indian Army Apache deployment: 16 AH-64E Apache helicopters — primarily with Army Aviation Corps. Indian Navy Apaches: 6 helicopters for maritime strike role.
Total: 22 helicopters. Apache AH-64E Guardian specifications: Primary weapon — AGM-114 Hellfire (anti-tank guided missile, 8 km range); Secondary — Hydra-70 rockets, AIM-92 Stinger (air-to-air), 30mm M230 chain gun; Sensors — AN/APG-78 Longbow radar (fire-and-forget ATGM engagement), FLIR (forward-looking infrared), night vision.
Combat employment: Pokhran Exercise Brahmastra (April 2026) showcased combined arms employment — Apache pop-up attacks coordinated with tank-infantry manoeuvre. FMS (Foreign Military Sales): US Government-to-Government sale under Arms Export Control Act — ensures interoperability, training, and spare parts support.
India also operates HAL Rudra (Dhruv-based armed helicopter) and is developing HAL IMRH (Indian Multi-Role Helicopter).

Q19 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (Security — India's defence modernisation, aviation, FMS procurement).
✍️ MAINS KEYWORDS	Apache AH-64E, Foreign Military Sales, Army Aviation Corps, anti-armour capability, defence indigenisation.
⚠️ COMMON MISTAKE	Attributing Apache to Indian Air Force — it is operated by Indian Army (16) and Indian Navy (6), not IAF.
📌 EXAM TIP	UPSC Prelims tests which service operates which platform — Army Aviation is distinct from IAF.
🎤 INTERVIEW	With Apache procurement from USA, how does India maintain strategic autonomy in aviation while seeking indigenisation through AMCA and IMRH?

📰 Read Full Article →

Question 20 of 24 Source →

Which of the following correctly describes the 'breeding ratio' concept in the context of Fast Breeder Reactors?

A The ratio of heat energy produced to electrical energy output in a fast reactor

B **The ratio of fissile material produced to fissile material consumed in the reactor** ✓

C The ratio of uranium-235 to uranium-238 in the reactor's mixed oxide fuel

D The ratio of fast neutrons to thermal neutrons sustaining the chain reaction

ANSWER & ANALYSIS

EXPLANATION

FACT: Breeding ratio = fissile material produced / fissile material consumed. A breeding ratio >1 means the reactor produces more fissile material (Pu-239 from U-238) than it consumes — making it a 'breeder.' The PFBR is designed with a breeding ratio ~1.05, meaning it generates 5% more fuel than it burns.
ANALYSIS: This is the fundamental concept that enables India's nuclear self-sufficiency logic.

CONCEPT NOTE

PFBR breeding mechanism: Reactor core contains MOX fuel (U-238 + Pu-239). Fast neutrons cause fission of Pu-239 (releasing energy + more neutrons).
Excess neutrons strike U-238 in blanket — U-238 captures neutron → U-239 → beta decay → Np-239 → beta decay → Pu-239 (new fissile material). Net result: More Pu-239 produced than consumed (breeding ratio >1).
Thorium blanket additionally produces U-233: Th-232 + neutron → Th-233 → Pa-233 → U-233 (Stage 3 fuel). India's three-stage logic: Stage 1 PHWRs produce Pu-239 from spent fuel → Stage 2 FBRs breed more Pu-239 + U-233 → Stage 3 AHWRs use U-233/Th-232 cycle.
India's thorium reserves: ~846,477 tonnes (25-30% of world total) in monazite sands (Kerala, Tamil Nadu coasts). India's uranium reserves: limited (~94,600 tonnes) — hence the strategic importance of the breeding cycle.

Q20 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (S&T — nuclear energy, three-stage programme, energy security).
✍️ MAINS KEYWORDS	breeding ratio, fast breeder reactor, plutonium breeding, thorium cycle, three-stage nuclear programme.
⚠️ COMMON MISTAKE	Defining breeding ratio as a heat-to-electricity conversion ratio — it specifically refers to fissile material production vs consumption.
📌 EXAM TIP	UPSC 2019 asked about breeding ratio and three-stage programme — know that breeding ratio >1 is the defining criterion of a true breeder.
🎤 INTERVIEW	Is India's three-stage nuclear programme still viable given Stage 2 is 16 years delayed and Stage 3 (thorium AHWRs) remains decades away?

📰 Read Full Article →

Question 21 of 24 Source →

Consider the following statements about the Suez Canal:

1. The Suez Canal is controlled by the Suez Canal Authority of Egypt.
2. Approximately 12% of global trade transits through the Suez Canal annually.
3. The Suez Canal connects the Red Sea to the Arabian Sea directly.

Which of the statements given above is/are correct?

A **1 and 2 only ✓**

B 2 and 3 only

C 1 only

D 1, 2 and 3

ANSWER & ANALYSIS

EXPLANATION

FACT: Statements 1 and 2 are correct. Statement 3 is WRONG — the Suez Canal connects the Red Sea to the Mediterranean Sea (not the Arabian Sea).

The route from the Arabian Sea continues through the Gulf of Aden, then Bab el-Mandeb strait, then the Red Sea, then the Suez Canal, then the Mediterranean. ANALYSIS: India-Europe trade uses this route — disruptions (Houthi attacks 2024-25, Canal blockage 2021) directly hit Indian exports.

CONCEPT NOTE

Suez Canal facts: Length: 193 km (no locks — sea-level canal unlike Panama which has locks). Width: 313 m (expanded). Connects: Mediterranean Sea (Port Said, north) to Red Sea (Port Tewfiq/Suez, south). Controlled by: Suez Canal Authority (Egypt) — nationalised by Nasser in 1956 (Suez Crisis).

Daily transits: ~51 vessels; annual revenue: ~$9 billion (Egypt). ~12% of global trade; ~30% of global container trade.

India-specific: Bulk of India's Europe-bound exports transit Suez. 2021 incident: Ever Given (container ship) blocked canal for 6 days — $10 billion/day estimated disruption. 2024-25: Houthi attacks in Red Sea diverted shipping around Cape of Good Hope — added 10-15 days + $1 million/voyage cost.

Exercise Cyclone-IV (India-Egypt) is partly motivated by strategic interest in Suez Canal stability.

Q21 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS1 (Geography — straits, waterways, chokepoints), GS2 (IR — Egypt-India relations, maritime trade), GS3 (Economy — trade routes, logistics costs).
✍️ MAINS KEYWORDS	Suez Canal, Egypt strategic importance, maritime chokepoints, Houthi Red Sea attacks, global supply chain.
⚠️ COMMON MISTAKE	Saying Suez Canal connects Red Sea to Arabian Sea — it connects Red Sea to Mediterranean. Arabian Sea is further east, after Bab el-Mandeb.
📌 EXAM TIP	World's critical maritime chokepoints: Strait of Hormuz (energy), Suez Canal (Europe-Asia trade), Malacca Strait (Indo-Pacific trade), Bab el-Mandeb (Red Sea access), Dover Strait (Europe).
🎤 INTERVIEW	How should India diversify its trade routes given recurrent disruptions at Suez/Red Sea chokepoints?

📰 Read Full Article →

Question 22 of 24 Source →

Which of the following pairs of nuclear test and year is CORRECTLY matched?

A **Smiling Buddha — 1974** ✓

B Operation Shakti — 1996

C Pokhran-II — 1974

D Operation Shakti — 5 devices tested on a single day

ANSWER & ANALYSIS

EXPLANATION

FACT: Smiling Buddha (Pokhran-I) was India's first nuclear test — May 18, 1974, at Pokhran, Rajasthan. It was described by India as a 'Peaceful Nuclear Explosion.' Operation Shakti (Pokhran-II) was in 1998 (not 1996).
Option D is incorrect — Pokhran-II involved 5 devices but in two separate test events: 3 on May 11 + 2 on May 13, 1998.

CONCEPT NOTE

India's nuclear tests: Pokhran-I (Smiling Buddha): May 18, 1974; single device; described as 'Peaceful Nuclear Explosion (PNE)' to avoid NPT implications; triggered formation of Nuclear Suppliers Group (NSG) in 1974 (to prevent nuclear technology proliferation). Pokhran-II (Operation Shakti): May 11 + May 13, 1998; 5 devices total (3 + 2); included thermonuclear device, fission device, and sub-kiloton devices; PM A.B. Vajpayee announced; India declared itself a nuclear weapons state.
Consequences of Pokhran-II: US and other nations imposed sanctions; India-Pakistan nuclear competition escalated; Pakistan conducted Chagai tests (5 devices, May 28, 1998); India announced No First Use doctrine. Current doctrine: No First Use (NFU); credible minimum deterrence; no first use against non-nuclear states; massive retaliation to any nuclear first strike.
Pokhran site: Thar Desert, Rajasthan — also the location of Exercise Brahmastra (Apache live-fire, April 2026).

Q22 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (Security — India's nuclear programme, nuclear doctrine), GS2 (IR — nuclear non-proliferation, NPT, NSG).
✍️ MAINS KEYWORDS	Pokhran-I, Operation Shakti, Smiling Buddha, NFU doctrine, NSG, NPT.
⚠️ COMMON MISTAKE	Saying Operation Shakti was in 1996 (it was 1998) or that all 5 devices were tested simultaneously (they were in 2 events: May 11 + May 13).
📌 EXAM TIP	Year of nuclear tests is frequently asked: 1974 (Smiling Buddha) and 1998 (Operation Shakti) — memorise both.
🎤 INTERVIEW	Should India reconsider its No First Use doctrine given evolving nuclear threats from both Pakistan and China simultaneously?

📰 Read Full Article →

Question 23 of 24 Source →

Which statement correctly explains why liquid sodium is preferred over water as the coolant in the Prototype Fast Breeder Reactor (PFBR) at Kalpakkam?

A Sodium has a higher boiling point than water, allowing operation at higher temperatures without pressurisation

B Sodium does not moderate (thermalise) neutrons, preserving the fast neutron energy needed for the breeder cycle ✓

C Sodium is non-radioactive and poses no radiation safety risk in the primary coolant loop

D Sodium is more abundant and cheaper than heavy water used in conventional Indian reactors

ANSWER & ANALYSIS

EXPLANATION

FACT: The primary reason sodium is used is that it does not slow down (thermalise) neutrons — fast neutrons are essential for fissioning U-238 and breeding Pu-239. Water (H_2O) would thermalise neutrons, defeating the fast reactor design.

While Option A is also true (sodium's boiling point is 882°C vs 100°C for water), it is not the PRIMARY design reason for choosing sodium. Options C and D are incorrect — sodium-24 becomes radioactive when irradiated; cost is not the driver.

CONCEPT NOTE

Sodium properties relevant to FBR design: (1) Low neutron moderation cross-section — does not thermalise neutrons (PRIMARY reason); (2) High boiling point (882°C) — operates at near-atmospheric pressure (vs high-pressure water circuits in PWRs/PHWRs); (3) Excellent thermal conductivity — efficient heat transfer; (4) Low operating pressure — simplifies reactor vessel design. Sodium challenges: (1) Reacts violently with water and air (sodium fire risk — special inert gas cover needed); (2) Becomes radioactive when irradiated (Na-24, 15-hour half-life) — secondary sodium circuit used to prevent radioactive sodium from reaching turbines.

PFBR uses three circuits: Primary sodium (radioactive) → Steam Generator → Secondary sodium → Turbine steam.

India's PHWRs use heavy water (D_2O) as moderator — slows neutrons to thermal speeds for U-235 fission; completely different design philosophy.

Q23 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS3 (S&T — nuclear reactor design, three-stage programme).
✍️ MAINS KEYWORDS	fast breeder reactor, sodium coolant, neutron moderation, PFBR, PHWR comparison.
⚠️ COMMON MISTAKE	Saying sodium is chosen because it is cheaper — cost is not the reason; neutron moderation property is the fundamental driver.
📌 EXAM TIP	UPSC has asked about PFBR coolant — the answer is sodium; the reason is its low neutron moderation cross-section (doesn't slow neutrons).
🎤 INTERVIEW	Given sodium fire risk requires elaborate secondary circuit engineering, was the PFBR design choice of sodium-cooling fully anticipated in India's cost and timeline estimates?

📰 Read Full Article →

Question 24 of 24 Source →

The 16th Finance Commission, chaired by Dr. Arvind Panagariya, has an award period of 2026-27 to 2030-31. Under which constitutional article is the Finance Commission constituted?

A Article 270

B Article 275

C **Article 280** ✓

D Article 282

ANSWER & ANALYSIS

EXPLANATION

FACT: The Finance Commission is constituted under Article 280 of the Constitution — the President is required to constitute it within 2 years of the Constitution's commencement and thereafter at the end of every five years or earlier. Articles 270 and 275 deal with tax distribution and grants (outcomes of FC recommendations), not FC constitution.

Article 282 allows expenditure by Centre/States for public purposes not within the Finance Commission's scope.

CONCEPT NOTE

Article 280: Finance Commission — (1) President constitutes every 5 years (or earlier); (2) Consists of a Chairman + 4 members appointed by President; (3) Qualifications as prescribed by Parliament. FC's functions: (1) Distribution of taxes between Centre and States (vertical devolution); (2) Allocation among States of their share of divisible pool (horizontal devolution — based on FC-determined criteria); (3) Grants to States (Article 275 grants); (4) Grants to local bodies (Panchayats + ULBs). 16th FC: Chairman: Dr. Arvind Panagariya; Award period 2026-31; RLB allocation: ₹4.35 lakh crore. Key FC concepts: Divisible pool = Centre's net tax revenue before sharing; State share: 41% (15th FC) → to be revised by 16th FC; Vertical devolution = Centre to States; Horizontal devolution = distribution among states. Article 243I: State Finance Commission (every 5 years) — for distribution from State to local bodies.

Article 243Y: Municipal Finance Commission (similar, for ULBs).

Q24 🎯 CONCEPT KIT

🔗 CROSS-PAPER	GS2 (Polity — Finance Commission, fiscal federalism, Centre-State financial relations).
✍️ MAINS KEYWORDS	Article 280, Finance Commission, vertical devolution, horizontal devolution, divisible pool.
⚠️ COMMON MISTAKE	Confusing Article 280 (FC constitution) with Article 275 (grants to states) or Article 270 (taxes distributed between Centre and States) — 280 is the parent provision establishing the institution.
📌 EXAM TIP	UPSC Prelims 2020 asked about Finance Commission constitutional basis — Article 280 is the correct answer.
🎤 INTERVIEW	Should the Finance Commission be made a permanent institution (like UPSC) rather than a body reconstituted every 5 years?

📰 Read Full Article →

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