

Solutions

DATE : (1st Sept- 7th Sept)

1) Answer: d)

Explanation:

- **Core Concept:** Angikaar 2025 is a **two-month, last-mile outreach** under **PMAY-Urban 2.0 (MoHUA)** to bridge **information gaps**, mobilise beneficiaries, and push **scheme saturation**.
- **Key Features/Design:**
 - **IEC & Awareness:** Door-to-door outreach, camps, help-desks, grievance linkages.
 - **Convergence:** Syncs with urban missions (e.g., sanitation, livelihoods) to simplify **documentation** and **entitlement access**.
 - **Targeting:** Focus on **urban poor, migrants, informal workers, women-headed households**.
- **Why (d) is Correct:** The campaign explicitly aims at **beneficiary awareness and last-mile delivery** for **urban housing**—not physical infrastructure or green drives.
- **Elimination of Options:**
 - **(a) Bharatmala:** Highway programme—unrelated to PMAY-U outreach.
 - **(b) Rural electrification:** Different ministry and mandate.
 - **(c) Environmental campaign:** Angikaar is **housing-centric**, not a generic eco-awareness drive.
- **Contemporary Angle:** Aligns with **“Housing for All”, saturation campaigns**, and **DBT** for faster ground-level delivery in dense urban settings.
- **Conclusion:** **(d)** best captures Angikaar 2025 as a **PMAY-U 2.0 last-mile awareness/saturation initiative**.

2) Answer: b)

Explanation:

- **Key Geographical Facts:** The **Beas River**—Sanskrit **Vipāśā (Vipasha)**—originates at **Beas Kund (near Rohtang Pass)**, traverses **Kullu** and **Kangra** valleys, and joins the Sutlej at **Harike (Punjab)**.
- **Hydro-Economic Relevance:** Supports **irrigation, hydropower** (e.g., Pong Dam context), and **tourism**; crucial for **flood management** in HP-Punjab.
- **Why (b) is Correct:** Only the **Beas** simultaneously matches the **Vipasha** epithet and the **Kullu-Kangra** valley association.
- **Elimination of Options:**
 - **(a) Ravi:** Sanskrit **Iravati**; valley linkage incorrect.
 - **(c) Chenab: Asikni/Chandrabhaga;** no Kullu-Kangra shaping.
 - **(d) Sutlej: Shutudri;** different valley system.
- **Conclusion:** **(b) Beas** is the correct identification (**Vipasha; Kullu-Kangra** valleys).

3) Answer: d)

Explanation:

- **Who/What:** **E.V. Ramasamy (Periyar)** founded the **Self-Respect Movement (1925)** in Tamil Nadu to advance **rationalism, anti-caste equality**, and **women’s rights**.
- **Core Tenets & Instruments:**
 - **Self-Respect Marriages** (without priests), critique of **Brahminical hierarchy**, opposition to **Devadasi** system, promotion of **dignity and education**.
- **Thinkers & Intellectual Lineage:** Influenced by **Jotiba Phule** and **B.R. Ambedkar** on social justice and annihilation of caste.
- **Enduring Impact:** Laid the **ideological foundation** for **Dravidian politics** and **social-justice welfare** in Tamil Nadu; reshaped discourse on **representation and rights**.
- **Elimination of Options:**
 - **(a) Non-Cooperation, (b) Khilafat, (c) Sarvodaya** are **distinct Gandhian/pan-Islamic** streams; not Periyar’s legacy.
- **Conclusion:** **(d)** is correct—Periyar is best known for the **Self-Respect Movement**.

4) Answer: b)

Explanation:

- **Nature & Agent:** **Mpox** is a **viral zoonotic disease** caused by the **mpox (monkeypox) virus** of the **Orthopoxvirus** genus.
- **Transmission & Clinical Profile:** Spreads via **close contact** with lesions/body fluids/contaminated materials; **incubation 5–21 days**; fever, lymphadenopathy, rash.
- **Clade Context:** **Clade I** (often more severe, Central Africa) and **Clade II** (linked to 2022 global spread, generally milder).
- **Global Governance Angle:** Declared a **Public Health Emergency of International Concern (PHEIC) in 2022**; status evolved later with targeted surveillance and response.
- **Elimination of Options:**
 - **(a)** Not food/water-borne exclusively; **close contact** is key.
 - **(c)** Not **bacterial**; antibiotics aren’t curative.
 - **(d)** Geography/timeframe and incubation claim are incorrect.
- **Conclusion:** **(b)** correctly captures **viral zoonosis + 2022 PHEIC** characterisation of mpox.

5) Answer: a)

Explanation:

- **Statement I — Single-Click 2FA: Correct.** UPI supports **Single-Click Two-Factor Authentication** as a **core security feature** to balance speed and safety.
- **Statement II — Banking Hours/Weekdays Only: Incorrect.** UPI enables **instant, interoperable transfers 24×7×365** (including weekends/holidays).
- **Statement III — ₹10 lakh/24-hour Cumulative Limit: Treated as Correct in exam logic.** NPCI permits a **higher daily ceiling (up to ₹10 lakh)** for **defined categories** (e.g., capital markets, insurance, certain merchant payments). **Bank/app-level caps may be lower**, but the **regulatory upper cap** is what questions typically key in.
- **Conclusion: (a) I and III only**—security feature **(I)** is valid; **(II)** is wrong due to 24×7 operations; **(III)** aligns with the **permitted daily ceiling** (with category/bank caveats).

6) Answer: d)

Explanation:

- **Core Concept — SWIFT & ISO 20022:**
 - **SWIFT** is a **Belgium-headquartered** cooperative (founded **1973** by **239 banks from 15 countries**) that provides a **secure, standardised financial messaging** network.
 - **ISO 20022** is an **open** (non-proprietary) **data standard** for richer, structured financial messages, improving **interoperability, analytics, and compliance**.
- **Why II is Correct:** SWIFT's network connects **11,000+ institutions** across **200+ countries/territories**, enabling **global reach** for payments, securities, trade finance, etc.
- **Why IV is Correct:** The **founding facts (1973; 239 banks; 15 countries)** are the historical basis of SWIFT's origin.
- **Why I is Incorrect:** SWIFT is **not US-headquartered**; its **HQ is in La Hulpe, Belgium**.
- **Why III is Incorrect:** **ISO 20022** is **not a closed/proprietary** protocol; it is an **open, industry** standard.
- **Conclusion: II and IV only** accurately describe SWIFT/ISO 20022 → **(d)**.

7) Answer: b)

Explanation:

- **Core Concept — Functional Genomics:**
 - Studies **gene functions and interactions** at **genome scale**, integrating **DNA, RNA (transcriptomics), and proteins (proteomics)** to link **genotype → phenotype**.
- **Statement-wise Analysis:**
 - **(I) Incorrect:** It does **not study only proteins**; it spans **genome + RNA + proteins** and their **networks**.
 - **(II) Correct:** Widely used in **oncology** to interpret **variant pathogenicity**, guide **targeted therapies**, and **stratify** patients.
 - **(III) Correct:** Its **central aim** is connecting **genetic variation** to **observable traits/disease**.
 - **(IV) Incorrect:** **Phenotype** means **observable characteristics** (clinical signs, traits), **not DNA** sequence.
- **Applications/Contemporary Angle:** **CRISPR screens, single-cell omics, eQTL mapping, and tumour boards** all rely on functional-genomic evidence.
- **Conclusion: II and III only** are correct → **(b)**.

8) Answer: a)

Explanation:

- **Core Concept — Fog–Pollution Nexus in the IGP:**
 - The **Indo-Gangetic Plain** endures severe **winter fog** episodes aggravated by **anthropogenic emissions** (vehicles, industry, **crop-residue burning**) and **stagnant boundary layers**.
- **Causal Chain:**
 - **Human activity** → **PM2.5/PM1 aerosols** → act as **cloud/fog condensation nuclei (CCN/FCN)** → promote **droplet formation and persistent fog**, especially under **temperature inversion** and **calm winds**.
- **Statement-wise Analysis:**
 - **Statement-I: Correct.** The IGP's **intense emissions** and **meteorology** cause prolonged, dense fog and hazardous **AQI** in winter.
 - **Statement-II: Correct and Explains I.** **PM2.5 from human sources** provides the **nuclei** that physically **enable/strengthen fog formation**, thereby **explaining I**.
- **Impacts & Policy Angle:** **Transport disruptions, respiratory morbidity, and economic losses**; countered by **NCAP, biomass management, clean fuels, and regional coordination**.
- **Conclusion: Both correct and II explains I** → **(a)**.

9) Answer: a)

Explanation:

- **Core Concept — WHO Model List of Essential Medicines (EML):**
 - A **global, evidence-based** guide listing **priority medicines** for **primary health needs**, intended to drive **equitable access and rational use**.
- **Update Mechanism & Purpose:**
 - **Updated biennially** by an **expert committee** assessing **clinical value, cost-effectiveness, and public-health need**.
 - Guides **national lists, procurement, insurance reimbursement, and standard treatment guidelines**.
- **Statement-wise Analysis:**
 - **Statement-I: Correct.** The **biennial revision cycle** is the established process.
 - **Statement-II: Correct and Explains I.** The **reason** for periodic updates is to **ensure access and rational prescribing** as **evidence/needs evolve**, thus **explaining I**.

- **Contemporary Angle:** Recent iterations strengthen NCDs, antimicrobials stewardship, oncology, and pandemic preparedness.
- **Conclusion:** Both correct and II explains I → (a).

10) Answer: d)

Explanation:

- **Core Concept — Himalayan Clean Energy & Climate Risk:**
 - The **Hindu Kush Himalaya (HKH)** has vast **hydropower potential** but remains **significantly underutilised**; **climate hazards** (e.g., GLOFs, landslides, extreme precipitation) threaten **existing and planned assets**.
- **Statement-wise Analysis:**
 - **Statement-I: Incorrect.** Claims of the region using **more than half** its hydropower/clean-energy potential are **overstated**; actual utilisation is **well below half** in many basins due to **terrain, finance, ecology, and transboundary complexities**.
 - **Statement-II: Correct.** **Climate risks**—notably **glacial-lake outburst floods**, proglacial lake expansion, and **extreme events**—jeopardise a large share of projects and require **resilient design** and **risk-informed siting**.
- **Policy/Practice Angle:** Calls for **basin-level planning**, **early-warning systems**, **sediment management**, **nature-based solutions**, **regional power-trade**, and **insurance/financing** tuned to **climate risk**.
- **Conclusion:** I is incorrect; II is correct → (d).

11) Answer: a)

Explanation:

- **Core Concept — Methandienone LTM Reference Material:**
 - A **laboratory-grade, highly purified standard** co-developed by **NDTL & NIPER-Guwahati** to **calibrate instruments** and **validate methods** for detecting **methandienone (an anabolic steroid)** via its **long-term metabolites**.
- **Why (a) is Correct (Anti-Doping Testing):**
 - **Reference materials** enable **accurate identification/quantification** of banned substances in **urine/blood**, improving **sensitivity, selectivity, and reproducibility** across dope-testing labs.
 - **Long-term metabolite (LTM) markers** extend the **detection window**, strengthening **deterrence** and **fair play** in sports.
- **What it Improves:** **Method validation**, **inter-lab comparability**, **QA/QC compliance**, and **alignment with international anti-doping protocols**.
- **Elimination of Options:**
 - **(b) Vaccines / (c) Diabetes / (d) Antibiotics** → **Unrelated** to steroid **doping detection**.
- **Conclusion:** **Anti-doping testing in sports** is the precise application—(a).

12) Answer: c)

Explanation:

- **Core Concept — Crude Birth Rate (CBR):**
 - **Definition:** **Number of live births per 1,000 population in a year**, using the **mid-year population** as the denominator.
 - **Formula:** $CBR = \frac{\text{LiveBirths in a Year}}{\text{Mid-Year Population}} \times 1,000$
- **Why (c) is Correct:** It gives the **standard demographic definition** used for cross-regional and time-series comparisons.
- **Policy/Planning Relevance:**
 - Inputs for **healthcare provisioning**, **maternal & child health**, **education**, **workforce** and **social security** planning.
 - **Trend insight:** **Falling CBR** → **demographic transition**, changing **dependency ratios**, and **policy re-targeting**.
- **Elimination of Options:**
 - **(a) Sex Ratio, (b) Crude Death Rate, (d) U5MR** → **Different indicators**.
- **Conclusion:** **CBR = live births per 1,000 mid-year population**—(c).

13) Answer: a)

Explanation:

- **Core Concept — Hallmarking Governance:**
 - **Hallmarking** certifies the **purity of precious metals** (gold/silver) to **protect consumers** and **standardise quality**.
- **Why (a) BIS is Correct:**
 - **Bureau of Indian Standards (BIS)** (under **Ministry of Consumer Affairs**) sets **standards**, **authorises hallmarking centres**, and enforces **HUID-based traceability** under the **BIS Act, 2016**.
- **Consumer & Market Impact:**
 - Enhances **trust**, curbs **mis-selling**, aligns with **global best practices**, and supports **formalisation** of the jewellery trade.
- **Elimination of Options:**
 - **(b) Ministry of Mines:** resource policy, not hallmarking regulation.
 - **(c) Accreditation body (e.g., NABL):** **accredits labs**, doesn't **regulate hallmarking**.
 - **(d) DGFT/Export bodies:** handle **trade**, not **purity certification**.
- **Conclusion:** **BIS is the statutory regulator** for hallmarking—(a).

14) Answer: a)

Explanation:

- **Core Concept — Mission 'Mausam' (Weather Services Context):**
 - An initiative under the **Ministry of Earth Sciences (MoES)** to **strengthen observation networks, modeling, and forecasting** for **weather & climate services** (agriculture, disaster management, transport, etc.).
- **Why (a) MoES is Correct:**
 - **IMD, NCMRWF, IITM** (MoES institutions) are the **implementing arms** for system upgrades, high-resolution models, and service delivery.

- **Governance & Delivery:**
 - Focus on **timely warnings, sector-specific advisories, and data assimilation** for improved **predictive skill**.
- **Elimination of Options:**
 - **(b)–(d)** pertain to other sectoral ministries; not the lead for national weather service modernisation.
- **Conclusion: Ministry of Earth Sciences** is the responsible ministry—**(a)**.

15) Answer: a)

Explanation:

- **Core Concept — ARTHA (Green Financing Framework):**
 - A **green-finance architecture** to channel **capital** into **post-mining land reclamation** and **productive reuse of reclaimed mines**, advancing **sustainable mining**.
- **Why (a) is Correct:**
 - Links **sustainable mine closure** with **financing mechanisms**, complementing guidance like **L.I.V.E.S.** for **responsible closures** and **community-centric outcomes**.
- **Expected Outcomes:**
 - **Environmental remediation, livelihood diversification, local asset creation**, and improved **ESG performance** in the mining sector.
- **Elimination of Options:**
 - **(b) Training programme / (c) AQ monitor / (d) Safety audit** → **Not financing frameworks for reclaimed mines**.
- **Conclusion: ARTHA is a Green Financing Framework for reclaimed mines—(a)**.

16) Answer: a)

Explanation:

- **Core Concept — NIRF: A government-backed ranking system** (launched **2015**) to evaluate Indian higher-education institutions across **five parameters: Teaching, Learning & Resources (TLR), Research & Professional Practice (RP), Graduation Outcomes (GO), Outreach & Inclusivity (OI), and Perception (PR)**.
- **Statement-wise Analysis:**
 - **Statement (I) — Correct: Launched in 2015** by the **Ministry of Education (then MHRD)** to provide a **transparent, standardised** evaluation framework with defined **weightages** and a **data verification** process.
 - **Statement (II) — Incorrect:** The assertion that **IISc Bengaluru** topped the **Overall** category in **2025** is **not correct for that year** (the top position was **IIT Madras**).
- **Why the Answer Fits:** Only **(I)** aligns with **NIRF's origin and purpose**; **(II)** misstates the **2025 overall topper**.
- **Conclusion: Only Statement (I) is correct → (a)**.

17) Answer: c)

Explanation:

- **Core Concept — Ayurveda Āhāra Regulations & Logo:** The **Food Safety and Standards (Ayurveda Āhāra) Regulations, 2022** create a **formal framework for Ayurvedic foods**, requiring **labelling/logo** to ensure **authenticity, safety, and consumer trust**.
- **Statement-wise Analysis:**
 - **Statement (I) — Correct:** The regulatory basis is the **FSS (Ayurveda Āhāra) Regulations, 2022**, administered via **FSSAI** with convergence to **Ayush** principles.
 - **Statement (II) — Correct:** The **logo's five leaves** symbolize the **Pañcha Mahābhūta—Ether, Air, Fire, Water, Earth—** reflecting **Ayurvedic philosophy**.
- **Why the Answer Fits:** Both the **legal foundation** and the **symbolism** are accurately captured.
- **Conclusion: Statements (I) and (II) are correct → (c)**.

18) Answer: c)

Explanation:

- **Core Concept — BIS & Hallmarking:** **Hallmarking** certifies the **purity of gold/silver** articles. The **Bureau of Indian Standards (BIS)** is the **statutory authority** administering standards, testing, and **HUID-based traceability**, under an updated legal framework.
- **Statement-wise Analysis:**
 - **Statement (I) — Correct: BIS** currently operates under the **BIS Act, 2016** (superseding the **1986 Act**), strengthening **standard-setting, conformity assessment, and enforcement**.
 - **Statement (II) — Correct: BIS**, under the **Ministry of Consumer Affairs**, regulates **hallmarking** through **authorised assaying & hallmarking centres**, surveillance, and compliance mechanisms.
- **Why the Answer Fits:** Both statements accurately reflect **institutional authority** and **legal foundation**.
- **Conclusion: Statements (I) and (II) are correct → (c)**.

19) Answer: b)

Explanation:

- **Core Concept — Lithium-ion Batteries:** **Rechargeable** systems with **high energy density, low self-discharge, minimal memory effect**, and **lightweight** chemistry compared with **lead-acid**; widely used in **EVs, electronics, and storage**.
- **Statement-wise Analysis:**
 - **Statement (I) — Incorrect:** Li-ion batteries are generally **lighter** (for comparable capacity) than **lead-acid** due to **higher specific energy**.
 - **Statement (II) — Correct:** Li-ion cells exhibit **negligible memory effect**, maintaining **usable capacity** without deep-cycle conditioning.
- **Why the Answer Fits:** Only **(II)** matches the **established performance characteristics** of Li-ion technology.
- **Conclusion: Only Statement (II) is correct → (b)**.

20) Answer: c)

Explanation:

- **Core Concept — Criminalisation of Politics & Legal Checks:** Constitutionalism and electoral integrity are reinforced by **statutory disqualifications** and **Supreme Court rulings** aimed at **excluding convicted individuals** and **improving transparency**.
- **Statement-wise Analysis:**
 - **Statement (I) — Correct:** **Lily Thomas v. Union of India (2013)** struck down the protective window for sitting legislators; **immediate disqualification upon conviction** now applies (subject to limited stays).
 - **Statement (II) — Correct:** Under the **Representation of the People Act, 1951 (Section 8)**, a person **convicted and sentenced to at least two years** faces disqualification **during incarceration** and for **six years after release**.
- **Why the Answer Fits:** Both statements reflect the **operative legal framework** curbing criminalisation through **automatic disqualification** and a **post-release bar**.
- **Conclusion: Statements (I) and (II) are correct → (c).**

21) Answer: b)

Explanation:

- **Core Concept — Dadabhai Naoroji's Economic Critique:** He propounded the **Drain of Wealth Theory**, arguing that colonial policies caused a **continuous, unrequited transfer** of India's resources to Britain.
- **Mechanisms of the Drain:** **Home Charges, high salaries/pensions of British officials, profits/remittances, and unrequited exports** that **impoverished** India.
- **Evidence & Advocacy:** Consolidated in "**Poverty and Un-British Rule in India**" (1901); used data-based reasoning before British and international audiences.
- **Impact:** Triggered **economic nationalism**, strengthened calls for **Swaraj**, and informed early Congress demands.
- **Elimination of Options:**
 - **(a) Permanent Settlement** → Lord Cornwallis policy.
 - **(c) "Economic Backwardness"** → Not Naoroji's named theory.
 - **(d) Dual Government** → Associated with **Robert Clive** in Bengal.
- **Conclusion: Drain of Wealth Theory** best captures Naoroji's contribution → **(b)**.

22) Answer: d)

Explanation:

- **Core Concept — Largest Anti-Naxal Push on the C'garh-Telangana Border:** **Operation Black Forest** denotes a **multi-agency, intelligence-led** offensive targeting **Maoist strongholds** in the **forested, hilly border belt**.
- **Operational Features:** **Large-scale deployment, area domination, cordon & search, IED neutralisation, logistics interdiction, and sustained presence** to deny safe havens.
- **Strategic Rationale:** Break **insurgent networks**, secure **civilian corridors**, enable **development delivery** and **policing** in difficult terrain.
- **Elimination of Options:**
 - **(a) Northeast insurgency** → Different theatre.
 - **(b) Illegal mining in Jharkhand** → Not the aim.
 - **(c) Wildlife conservation** → Not an enforcement operation.
- **Conclusion: It is the largest anti-Naxal operation along the Chhattisgarh-Telangana border → (d).**

23) Answer: d)

Explanation:

- **Core Concept — Germany's Land Borders:** Germany borders **9 countries: Denmark (N), Poland, Czechia (E), Austria, Switzerland (S), France, Luxembourg, Belgium, Netherlands (W)**.
- **Why Italy Is the Outlier:** Italy lies **south of the Alps** and **shares no land border** with Germany.
- **Elimination:**
 - **(a) Poland** → Eastern neighbour.
 - **(b) France** → Western neighbour.
 - **(c) Denmark** → Northern neighbour.
- **Conclusion: Italy does not share a land border with Germany → (d).**

24) Answer: a)

Explanation:

- **Core Concept — Environment Audit Rules, 2025:** Create a **two-tier framework** for environmental audits: a central **Environment Audit Designate Agency (EADA)** and **Registered Environment Auditors (REAs)**.
- **Statement-wise Check:**
 - **(I) Correct:** EADA is tasked to **certify, register, empanel, and oversee** auditors; ensures **standards, impartial assignment, and quality control**.
 - **(II) Incorrect:** REA eligibility extends to **qualified professionals** (environmental engineers, auditors, domain experts, etc.), **not only government officials**.
- **Governance Logic:** Professionalisation, **random allocation, codes of conduct, and performance monitoring** to improve **compliance credibility**.
- **Conclusion: I only is correct → (a).**

25) Answer: b)

Explanation:

- **Core Concept — GST Council's Constitutional Role:** An apex **federal body** that **recommends/sets GST rates, exemptions, and policy** for a unified indirect tax regime.
 - **Statement-wise Check:**
 - **(I) Correct: Union Finance Minister** is the **Chairperson**.
 - **(II) Correct:** Constituted under **Article 279A** (101st CAA, 2016) as a **constitutional body**.
 - **(III) Correct: Decides/recommends** rate slabs, exemptions, procedural changes, and **policy direction** for GST.
 - **Institutional Design:** Includes **State Finance Ministers**, Union MoS (Revenue/Finance); **weighted voting** fosters **cooperative federalism**.
 - **Conclusion: I, II and III** are correct → **(b)**.
- 26) Answer: a)
Explanation:
- **Core Concept — ECCE under NEP 2020:** NEP 2020 places **Early Childhood Care & Education (ECCE)** at the **foundation** of the 5+3+3+4 structure and seeks **smooth transition** from Anganwadi to Grade-1 through **co-location** and convergence with health–nutrition services.
 - **Statement-wise Analysis:**
 - **(I) Correct:** NEP 2020 explicitly recognises **ECCE as the bedrock** of lifelong learning and mandates **three years of pre-school**.
 - **(II) Correct: Co-location prioritisation** is directed to **marginalised/remote** areas to improve access and **school readiness**.
 - **(III) Incorrect: Not all AWCs** are yet **co-located** with schools having Grade-1; roll-out is **phased/ongoing**.
 - **Conclusion: I & II only** → **(a)**.
- 27) Answer: a)
Explanation:
- **Core Concept — Critical Minerals Recycling (NCMM):** The scheme strengthens a **circular economy** by **recycling critical minerals** (e-waste, Li-ion scrap), using **capex & opex incentives** to crowd-in private investment and technology.
 - **Statement-wise Analysis:**
 - **(I) Correct: Opex subsidy** structured at **40% (Year-2)** and **60% (Year-5)** on **incremental sales**, with ceilings/guardrails.
 - **(II) Incorrect: Capex subsidy is 20%** (limited to plant & machinery), **not 40%**.
 - **Conclusion: I only** → **(a)**.
- 28) Answer: c)
Explanation:
- **Core Concept — Interstellar Dust Grains:** Micron/sub-micron **solid particles** that **form in stellar outflows** (e.g., **red giants, supernovae**) and pervade the **interstellar medium (ISM)**, shaping **star formation, chemistry, and radiative transfer**.
 - **Statement-wise Analysis:**
 - **(I) Incorrect: Dust assists cooling** (via IR emission) and **promotes collapse**; it does **not prevent** star formation.
 - **(II) Correct:** Composed largely of **silicates** and **carbonaceous** materials (graphite/PAHs).
 - **(III) Correct: Condense in outer layers** of **red giants/AGB stars**.
 - **(IV) Correct: Dispersed** into the ISM by **stellar winds and explosions** (e.g., supernovae).
 - **Conclusion: II, III & IV only** → **(c)**.
- 29) Answer: c)
Explanation:
- **Core Concept — Ancient Nalanda University:** A **5th-century CE residential** Buddhist mahavihara in present-day **Bihar**, a hub of **pan-Asian scholarship** with vast libraries and hostels; later **UNESCO World Heritage Site**.
 - **Statement-wise Analysis:**
 - **(I) Correct:** Widely regarded as the **earliest large-scale residential university** model.
 - **(II) Correct: Late-period shifts** (including **tantric** influences under the **Pālas**) are associated in accounts with **institutional weakening/decline**, before final **destruction c. 1200 CE** by **Bakhtiyar Khalji**.
 - **(III) Incorrect:** Founded in the **5th century CE** (often linked to **Kumaragupta I**), **not** the 7th century under **Harsha**.
 - **Conclusion: I & II only** → **(c)**.
- 30) Answer: c)
Explanation:
- **Core Concept — Indian Rosewood (Dalbergia latifolia):** A **deciduous timber** species **native to India & Indonesia**, valued for **high-quality wood, apiculture, and traditional medicine**.
 - **Statement-wise Analysis:**
 - **Statement-I: Correct: Native range** includes **India and Indonesia**; significant economic/ecological roles.
 - **Statement-II: Incorrect:** Species is **edaphically versatile**—thrives in **lateritic, alluvial, and black-cotton** soils; **not restricted** to black cotton soils.
 - **Conclusion: Statement-I correct; Statement-II incorrect** → **(c)**.
- 31) Answer: c)
Explanation:
- **Core Concept — CDB's Mandate & Nature:** The **Coconut Development Board (CDB)** is a **statutory body** under the **Ministry of Agriculture & Farmers Welfare** tasked with the **integrated development** of **coconut cultivation and industry**.
 - **Key Facts:** Established in **1981** by an **Act of Parliament**; **HQ: Kochi**; supports **productivity enhancement, value addition/diversification, research & extension, market development, and farmer support** in coastal states.
 - **Why others are wrong:**

- (a) Wrong **ministry/focus** (export-only).
- (b) **Non-statutory** & wrong **ministry**.
- (d) Not a mere **division** under Rural Development.
- **Conclusion:** CDB is a **statutory board** under **Agriculture & Farmers Welfare** for **integrated coconut sector development** → (c).

32) Answer: b)

Explanation:

- **Core Concept** — **EX MAITREE:** A bilateral **Army exercise** between **India & Thailand** focusing on **counter-terrorism, sub-conventional ops, and interoperability**.
- **Key Features:** **Company-level drills**, semi-urban/jungle scenarios, **tactics & room intervention, IED awareness, HADR coordination; held alternately** in India & Thailand; initiated **2006** (Act East context).
- **Why others are wrong:**
 - (a) Not tri-services/Indonesia.
 - (c) Not naval/Sri Lanka.
 - (d) Not a SAARC disaster drill.
- **Conclusion:** **India-Thailand joint Army exercise on CT ops** → (b).

33) Answer: a)

Explanation:

- **Core Concept** — **Solow Paradox:** Despite widespread **computer/IT adoption**, **measured productivity** did **not rise** as expected (“you can see the computer age everywhere but in the productivity statistics”).
- **Why the Paradox:**
 - **Adjustment/Lag:** Organizational redesign, skills, and complementary capital take time.
 - **Mismeasurement:** Intangibles and quality improvements undercounted.
 - **Uneven Diffusion:** Gains concentrated in early-adopting sectors/firms.
- **Why others are wrong:**
 - (b) Generic interest–investment relation.
 - (c) **Phillips Curve** (inflation–unemployment).
 - (d) Not about inability of tech to raise **capital formation**.
- **Conclusion:** It captures the **disconnect between IT adoption and recorded productivity** → (a).

34) Answer: d)

Explanation:

- **Core Concept** — **BHARATI Initiative:** A national push to **support agri-food startups** for **export enablement and innovation** in **high-value agricultural categories**.
- **Mechanism & Aims:** **Incubation/acceleration**, tech adoption, **traceability & quality**, market access; targets **100+ startups**, aligns with **Atmanirbhar Bharat** and **Startup India**, and seeks to raise **agri-exports**.
- **Why others are wrong:**
 - (a) Seed banks/conservation ≠ startup export enablement.
 - (b) Food parks in tribal regions (different scheme family).
 - (c) Solar micro-grids (energy sector).
- **Conclusion:** **Export-oriented, startup-led agritech framework** → (d).

35) Answer: b)

Explanation:

- **Core Concept** — **Power of Siberia-2 (PoS-2):** A proposed **gas pipeline** to transport **West Siberian gas (Russia)** to **northern China** via **eastern Mongolia**.
- **Strategic Significance:** Complements PoS-1, **diversifies** Russia’s export routes, supports China’s **gas demand/energy security**, and deepens **Russia–China energy ties**.
- **Why others are wrong:**
 - (a) No direct India linkage.
 - (c) Caspian–Europe via Turkey (different corridor).
 - (d) Not Far East–southern China via Kazakhstan.
- **Conclusion:** Route is **West Siberia → Mongolia → North China** → (b).

36) Answer: c)

Explanation:

- **Core Concept** — **CDB’s Mandate & Nature:** The **Coconut Development Board (CDB)** is a **statutory body** under the **Ministry of Agriculture & Farmers Welfare** tasked with the **integrated development** of **coconut cultivation and industry**.
- **Key Facts:** Established in **1981** by an **Act of Parliament**; **HQ: Kochi**; supports **productivity enhancement, value addition/diversification, research & extension, market development**, and **farmer support** in coastal states.
- **Why others are wrong:**
 - (a) Wrong **ministry/focus** (export-only).
 - (b) **Non-statutory** & wrong **ministry**.
 - (d) Not a mere **division** under Rural Development.
- **Conclusion:** CDB is a **statutory board** under **Agriculture & Farmers Welfare** for **integrated coconut sector development** → (c).

37) Answer: b)

Explanation:

- **Core Concept — EX MAITREE:** A bilateral Army exercise between India & Thailand focusing on counter-terrorism, sub-conventional ops, and interoperability.
- **Key Features:** Company-level drills, semi-urban/jungle scenarios, tactics & room intervention, IED awareness, HADR coordination; held alternately in India & Thailand; initiated 2006 (Act East context).
- **Why others are wrong:**
 - (a) Not tri-services/Indonesia.
 - (c) Not naval/Sri Lanka.
 - (d) Not a SAARC disaster drill.
- **Conclusion:** India–Thailand joint Army exercise on CT ops → (b).

38) Answer: a)

Explanation:

- **Core Concept — Solow Paradox:** Despite widespread computer/IT adoption, measured productivity did not rise as expected (“you can see the computer age everywhere but in the productivity statistics”).
- **Why the Paradox:**
 - **Adjustment/Lag:** Organizational redesign, skills, and complementary capital take time.
 - **Mismeasurement:** Intangibles and quality improvements undercounted.
 - **Uneven Diffusion:** Gains concentrated in early-adopting sectors/firms.
- **Why others are wrong:**
 - (b) Generic interest–investment relation.
 - (c) Phillips Curve (inflation–unemployment).
 - (d) Not about inability of tech to raise capital formation.
- **Conclusion:** It captures the disconnect between IT adoption and recorded productivity → (a).

39) Answer: d)

Explanation:

- **Core Concept — BHARATI Initiative:** A national push to support agri-food startups for export enablement and innovation in high-value agricultural categories.
- **Mechanism & Aims:** Incubation/acceleration, tech adoption, traceability & quality, market access; targets 100+ startups, aligns with Atmanirbhar Bharat and Startup India, and seeks to raise agri-exports.
- **Why others are wrong:**
 - (a) Seed banks/conservation ≠ startup export enablement.
 - (b) Food parks in tribal regions (different scheme family).
 - (c) Solar micro-grids (energy sector).
- **Conclusion:** Export-oriented, startup-led agritech framework → (d).

40) Answer: b)

Explanation:

- **Core Concept — Power of Siberia-2 (PoS-2):** A proposed gas pipeline to transport West Siberian gas (Russia) to northern China via eastern Mongolia.
- **Strategic Significance:** Complements PoS-1, diversifies Russia’s export routes, supports China’s gas demand/energy security, and deepens Russia–China energy ties.
- **Why others are wrong:**
 - (a) No direct India linkage.
 - (c) Caspian–Europe via Turkey (different corridor).
 - (d) Not Far East–southern China via Kazakhstan.
- **Conclusion:** Route is West Siberia → Mongolia → North China → (b).

41) Answer: b)

Explanation:

- **Core Concept — National Policy on Biofuels, 2018:** The policy broadens feedstocks for ethanol to include non-edible and waste materials; it is not limited to edible crops.
- **Statement Analysis:**
 - I — Incorrect: It does not allow ethanol exclusively from edible feedstocks; non-edible, waste and damaged grains are permitted.
 - II — Correct: Second-generation (2G) biofuels use lignocellulosic biomass/wastes (e.g., agri-residue, bagasse, UCO), helping bypass the food vs fuel conflict.
- **Conclusion:** Only Statement II is correct → (b).

42) Answer: c)

Explanation:

- **Core Concept — Role of SHGs:** Self-Help Groups enhance women’s economic empowerment and social capital through collective savings/credit, micro-enterprise, and community mobilisation.
- **Statement Analysis:**
 - I — Correct: SHGs enable access to formal credit, income generation, skill training, and market linkages.

- **II — Correct:** SHGs build **solidarity networks, leadership, and agency**, helping **challenge gender biases** and improving **local governance participation**.
- **Conclusion: Both I and II are correct → (c).**

43) Answer: a)

Explanation:

- **Core Concept — Ethanol Blending & 3G Biofuels:**
 - **Blending Benefits:** Ethanol–petrol blends **lower CO₂ emissions** per km and **substitute crude imports**, yielding **foreign-exchange savings**.
 - **Third-Generation (3G):** Generally **algal-based** (microalgae/cyanobacteria); genetic engineering may be used but is **not the sole basis**.
- **Statement Analysis:**
 - **I — Correct:** Blending has **reduced emissions** and **saved forex**.
 - **II — Incorrect:** 3G biofuels are **not only** from **genetically engineered microorganisms**.
- **Conclusion: Only Statement I is correct → (a).**

44) Answer: c)

Explanation:

- **Core Concept — Constitutional Clemency:**
 - **Article 72 (President):** Power to grant **pardon, reprieve, respite, remission, or suspend/commute** sentences (including **court-martial, Union-law offences, and death sentences**).
 - **Article 161 (Governor):** Similar powers **within the State's executive domain**.
- **Statement Analysis:**
 - **I — Correct.**
 - **II — Correct.**
- **Conclusion: Both I and II are correct → (c).**

45) Answer: a)

Explanation:

- **Core Concept — Biofuel Generations & Feedstocks:**
 - **1G: Edible** feedstocks (sugarcane, corn, wheat; vegetable oils).
 - **2G: Non-edible, lignocellulosic biomass/wastes** (agri-residue, bagasse, forestry waste, UCO).
 - **3G: Algal biomass** (microalgae/cyanobacteria).
- **Pair Check:**
 - **Third Gen | Microalgae & cyanobacteria — Correct.**
 - **First Gen | Lignocellulosic biomass — Incorrect** (that's 2G).
 - **Second Gen | Edible feedstocks — Incorrect** (that's 1G).
- **Conclusion: Only one pair is correctly matched → (a).**

46) Answer: d)

Explanation:

- **Core Concept — Adi Vaani:** India's **first AI-powered translation platform** dedicated to **tribal languages**, launched by the **Ministry of Tribal Affairs**.
- **Purpose & Scope:**
 - **Bridge communication gaps** between tribal and non-tribal communities.
 - **Preserve & digitize** endangered languages; aid **education, health, governance** access.
 - **Initial languages: Santali, Bhili, Mundari, Gondi** (with scope to expand).
- **Elimination:**
 - **(a)** Land-record digitization — unrelated.
 - **(b)** Tribal e-commerce — not its mandate.
 - **(c)** Forest-cover monitoring — not its function.
- **Conclusion: AI translation for tribal languages** is the platform's primary objective → **(d).**

47) Answer: c)

Explanation:

- **Core Concept — IEPFA's Parent Ministry:** Investor Education and Protection Fund Authority is under the **Ministry of Corporate Affairs**.
- **Mandate:**
 - Manage **unclaimed dividends/shares**, refunds of **matured deposits/debentures**.
 - Conduct **investor awareness** (incl. initiatives like **Niveshak Didi**).
- **Elimination: Finance/Skill/Commerce** do **not** administer IEPFA.
- **Conclusion: Ministry of Corporate Affairs → (c).**

48) Answer: d)

Explanation:

- **Rivers through Afghanistan:**
 - **Amu Darya** — along the **northern** boundary.
 - **Kabul River** — **eastern** Afghanistan into Pakistan.
 - **Helmand** — **southwestern** Afghanistan.

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- **Outlier:** Brahmaputra flows through **Tibet-India-Bangladesh**, not Afghanistan.
- **Conclusion:** River **not** flowing through Afghanistan → **(d) Brahmaputra**.

49) Answer: b)

Explanation:

- **Core Concept — SCO Secretariat Location:** **Beijing, China** hosts the **SCO Secretariat** (administration, coordination, documentation).
- **Associated Body:** **RATS** (Regional Anti-Terrorist Structure) is in **Tashkent, Uzbekistan**.
- **Elimination:** **Moscow/Astana** are not SCO Secretariat locations.
- **Conclusion:** **Beijing, China** → **(b)**.

50) Answer: d)

Explanation:

- **Core Concept — Jarosite:** A **yellow to yellow-brown, iron-rich sulphate mineral** (commonly $KFe_3(SO_4)_2(OH)_6$) forming in **acidic, oxidizing, aqueous** settings; often linked to **volcanic/hydrothermal** systems.
- **Significance:** Indicator of **water-rock interactions**; also detected on **Mars**, informing past **aqueous environments**.
- **Elimination:**
 - **(a)** Manganese ore — incorrect.
 - **(b)** Sodium chloride crystal = **halite**.
 - **(c)** Phosphatic sedimentary rock — unrelated.
- **Conclusion:** **Yellow, iron-rich sulphate mineral** → **(d)**.

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