RAMAKRISHNA MISSION - GEO IAS

DAILY UPSC NEWSPAPER ANALYSIS

21 NOVEMBER 2026 | SATURDAY

10 in-depth topics | 10 educational visuals | 10 Prelims MCQs with detailed solutions | 4 GS I-IV model answers

Editorial scope: News published on 19-20 November and available before the morning edition. Events are described as reported; developing diplomatic and judicial claims should be cross-checked against final official documents. Topic explanations are original educational synthesis.

Map and image policy: Ten original explanatory visuals appear with their respective topics; three are reference maps with coastline/country-boundary data. They are not official Survey of India maps or topographic relief products.

01. Shenzhen trilateral summit, nuclear risks and international institutions

GS linkage: GS-II: international relations; GS-III: security

WHY IN NEWS

The 20 November reporting described a meeting of the United States, China and Russia at Shenzhen and a four-point declaration on UN reform, oil supplies, the International Criminal Court and nuclear-risk dialogue. The report explicitly noted the absence of a new enforceable arms-control agreement. This distinction between diplomatic declaration and treaty obligation is central to an exam answer.

KEY POINTS FOR UPSC

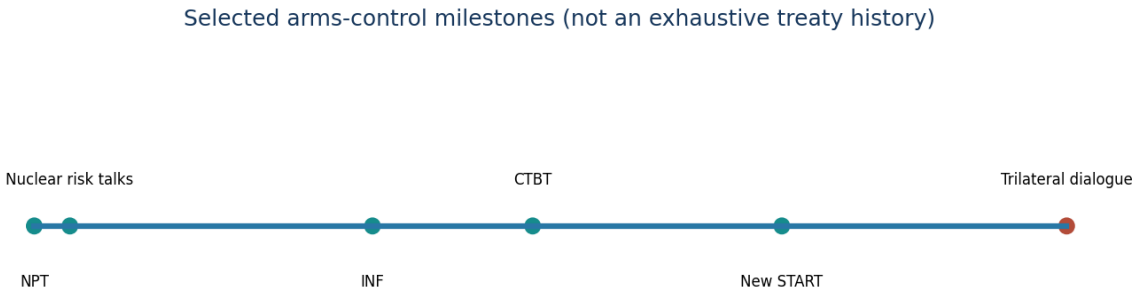
Prelims: P5 of UNSC are China, France, Russia, UK, US; ICC is not a principal organ of UN; ICJ is. Do not confuse political summit declaration with a ratified treaty. Way forward: inclusive nuclear-risk mechanisms, stronger verification, energy resilience and UN institutional reform.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

Nuclear deterrence rests on the threat of unacceptable retaliation; arms control instead seeks agreed limits, transparency and verification. The Nuclear Non-Proliferation Treaty (NPT) rests on non-proliferation, peaceful use and disarmament obligations; India is not a party. The Comprehensive Nuclear-Test-Ban Treaty (CTBT) has not entered into force. New START was a bilateral US-Russia strategic-arms framework, not a China-inclusive treaty. The International Criminal Court (ICC) prosecutes individuals under the Rome Statute; the International Court of Justice (ICJ) adjudicates disputes between states and gives advisory opinions. Immunity and jurisdiction claims require precise legal treatment rather than political slogans.

MULTIDIMENSIONAL MAINS ANALYSIS

For India, an exclusive great-power forum could ease immediate escalation but weaken representation of other states. Nuclear-risk reduction may include hotlines, notification of tests, crisis communications and doctrinal clarity; actual disarmament needs verifiable ceilings and compliance mechanisms. Oil-market coordination may ease supply shocks but does not substitute for energy diversification. UN reform should address representation, veto use and accountability. India can support strategic stability while defending multilateral legitimacy, Global South voice and sovereign decision-making.



Visual 1. Arms-control chronology: selected treaties and summit context.

News reference:
https://indianexpress.com/article/upsc-current-affairs/upsc-key-shenzhen-peace-treaty-rohingyas-and-air-pollution-10971758/

02. India-Japan 2+2 dialogue and live-fire training cooperation

GS linkage: GS-II: bilateral relations; GS-III: defence technology

WHY IN NEWS

India and Japan announced a Letter of Intent for use of Indian firing ranges by Japan Self-Defence Forces, including surface-to-ship missile training, during their fourth 2+2 ministerial dialogue in Tokyo. A Letter of Intent indicates a framework or intention; its operational details require subsequent arrangements.

KEY POINTS FOR UPSC

Prelims: Japan lies east of the Korean peninsula; the East China Sea lies between Japan and China; the Sea of Japan lies west of Japan. The Quad comprises India, Japan, Australia and the US. Way forward: implement training safely, protect sensitive technologies, broaden humanitarian assistance and disaster relief, and deepen industrial collaboration.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

The 2+2 mechanism brings together foreign and defence ministers, allowing diplomatic strategy, military interoperability, technology security and regional assessments to be considered jointly. India also has ministerial 2+2 formats with the US, Australia and Russia. Japan is a constitutional democracy with Self-Defence Forces; its maritime security concerns include sea lanes, island security and regional coercion. India-Japan defence ties intersect with the Quad but are not a NATO-style mutual defence treaty. Exercise Dharma Guardian is an army exercise; JIMEX is maritime; Veer Guardian is an air exercise.

MULTIDIMENSIONAL MAINS ANALYSIS

Practical cooperation can improve logistics, joint operational familiarity, maritime-domain awareness, anti-submarine capability, resilient supply chains and dual-use technology. Yet defence exports, technology transfer, intelligence protection, cost-sharing and interoperability create constraints. Japan and India have distinct threat perceptions and strategic autonomy concerns. A balanced policy must expand joint training while avoiding the impression that all Indo-Pacific security challenges can be resolved through military alignment alone.



Visual 2. Reference map: strategic locations in the Indo-Pacific.

News reference:
https://indianexpress.com/article/upsc-current-affairs/upsc-key-shenzhen-peace-treaty-rohingyas-and-air-pollution-10971758/

03. SCO Civilisational Dialogue and cultural diplomacy

GS linkage: GS-I: heritage; GS-II: regional groupings

WHY IN NEWS

The first Shanghai Cooperation Organisation (SCO) Civilisational Dialogue Forum was scheduled in New Delhi on 20 November, bringing together culture officials, scholars and diplomats. Cultural participation by states with strained bilateral relations illustrates the distinction between a multilateral obligation and bilateral normalisation.

KEY POINTS FOR UPSC

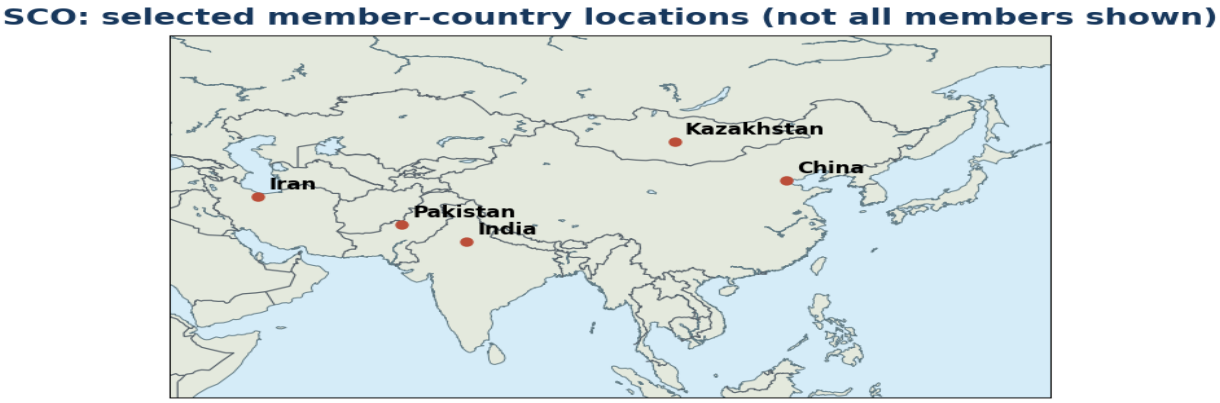
Prelims: SCO headquarters is in Beijing; RATS is in Tashkent. Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan are in Central Asia; Iran has a Persian Gulf coastline. Way forward: joint catalogues, digitisation, provenance standards, multilingual scholarly exchanges and conservation training.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

The SCO was established in Shanghai in 2001, evolving from the Shanghai Five. Its Charter was signed in 2002 and entered into force in 2003. The current ten members reported are India, Pakistan, China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Iran and Belarus. India and Pakistan joined in 2017, Iran in 2023 and Belarus in 2024. Its Regional Anti-Terrorist Structure (RATS) is based in Tashkent. SCO is not a collective-defence alliance. India also uses platforms such as UNESCO and bilateral cultural agreements to preserve shared heritage.

MULTIDIMENSIONAL MAINS ANALYSIS

Civilisational dialogue may improve museum cooperation, manuscript preservation, archaeology, academic exchange, tourism and shared conservation practices. It can also prevent heritage from being reduced to competitive national narratives. Yet contested historical interpretations, security tensions and unequal research capacities can obstruct genuine cooperation. Archaeological evidence must be dated carefully and distinguished from mythology or modern political claims. Multilateral cultural diplomacy should protect scientific independence and local community participation.



Visual 3. Reference map: selected SCO members, with political boundaries.

News reference:
https://indianexpress.com/article/upsc-current-affairs/upsc-key-shenzhen-peace-treaty-rohingyas-and-air-pollution-10971758/

04. COP31 fossil-fuel negotiations and climate equity

GS linkage: GS-III: environment; GS-II: global governance

WHY IN NEWS

At COP31 in Turkey, a revised draft negotiating text reportedly removed references to transitioning away from fossil fuels, exposing disagreement over the pace, financing and distribution of costs of decarbonisation. Draft text is not the same as a final negotiated COP decision; candidates must track the final adopted outcome separately.

KEY POINTS FOR UPSC

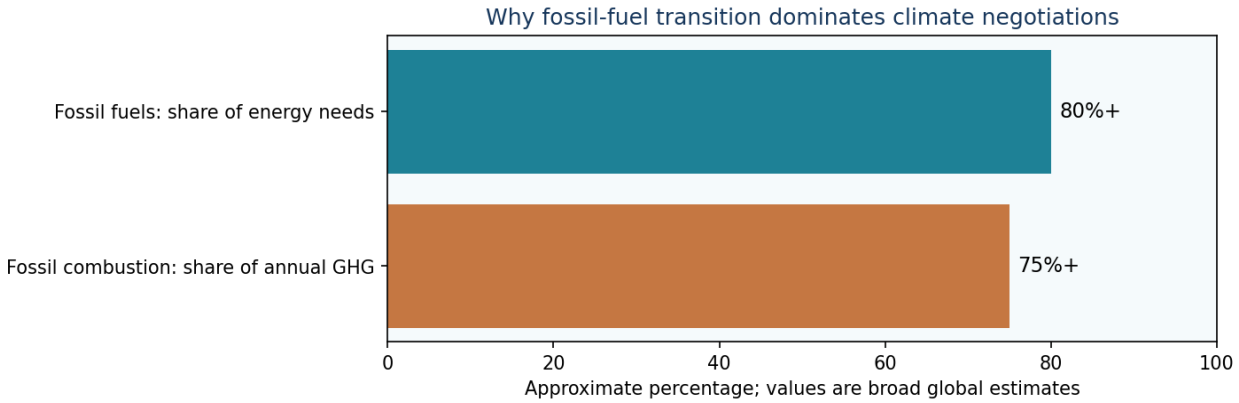
Prelims: CO2 is long-lived; methane is more potent over shorter horizons; adaptation and mitigation are different. A COP draft is not binding law. Way forward: predictable concessional finance, credible transition plans, workforce reskilling, transparent carbon accounting and adaptation investment.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992; the Paris Agreement was adopted in 2015. Its temperature objective is to hold warming well below 2 degrees Celsius and pursue efforts to limit it to 1.5 degrees above pre-industrial levels. Nationally Determined Contributions (NDCs) are nationally prepared climate plans; the global stocktake assesses collective progress. Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC) recognises differences in historical responsibility and capacity. COP28 called for transitioning away from fossil fuels in energy systems, a formulation distinct from a universally binding fossil-fuel phase-out treaty.

MULTIDIMENSIONAL MAINS ANALYSIS

Climate mitigation requires clean power, efficient grids, electrification, industrial process change, methane control and nature-based solutions, while adaptation needs resilient agriculture, cooling, water security and disaster preparedness. Developing states argue that finance, technology access and a just transition must accompany ambition. Exporters fear stranded assets; importers fear affordability shocks. India must reconcile development, energy access, air quality, employment and climate obligations rather than treating these as mutually exclusive.



Visual 4. Reported approximate global energy and greenhouse-gas dependence on fossil fuels.

News reference:
https://indianexpress.com/article/upsc-current-affairs/upsc-key-shenzhen-peace-treaty-rohingyas-and-air-pollution-10971758/

05. ICJ judgment on Rohingya and international refugee protection

GS linkage: GS-II: international law, human rights, neighbourhood

WHY IN NEWS

The Indian Express reported an International Court of Justice judgment concerning Myanmar's treatment of Rohingya in northern Rakhine State. The judgment, as reported, found state responsibility for genocide and addressed reparations and safe return. This is a serious legal development; distinguish the judgment from earlier provisional measures and from separate criminal accountability proceedings.

KEY POINTS FOR UPSC

Prelims: Rakhine lies in western Myanmar on the Bay of Bengal; Bangladesh lies to its west/northwest. ICJ judges states; ICC prosecutes individuals. Way forward: evidence preservation, humanitarian access, child protection and rights-based regional diplomacy.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

The 1948 Genocide Convention defines prohibited acts committed with intent to destroy, in whole or in part, a national, ethnic, racial or religious group. The ICJ is the UN's principal judicial organ; it hears contentious cases between states when jurisdiction exists. Its judgments in contentious cases are binding on parties, though enforcement can be difficult. The ICC is a separate permanent criminal court concerned with individual responsibility. The 1951 Refugee Convention and 1967 Protocol establish a major international refugee-protection framework; India is not party to either. Non-refoulement is a core protection principle, but its application must be analysed with attention to legal status and applicable obligations.

MULTIDIMENSIONAL MAINS ANALYSIS

The Rohingya crisis combines statelessness, exclusionary citizenship rules, communal violence, forced displacement and cross-border humanitarian burdens, especially in Bangladesh. India faces security screening, humanitarian responsibilities, border governance and diplomatic concerns simultaneously. Long-term solutions need accountability, documentation, safe and voluntary repatriation, restoration of rights, regional burden-sharing and independent monitoring. Repatriation without credible safety and citizenship guarantees risks renewed displacement.



Visual 5. Reference locator for Rakhine and neighbouring countries.

News reference:
https://indianexpress.com/article/upsc-current-affairs/upsc-key-shenzhen-peace-treaty-rohingyas-and-air-pollution-10971758/

06. Potato cultivation in lunar regolith simulants

GS linkage: GS-III: space biotechnology and food systems

WHY IN NEWS

A reported study in npj Microgravity explored potato growth in Earth-made lunar regolith simulants supplemented with vermicompost. Researchers observed some root and tuber growth at a low amendment level and yields comparable to Earth-soil controls at a higher amendment level. The experiment does not mean potatoes have been cultivated on the Moon.

KEY POINTS FOR UPSC

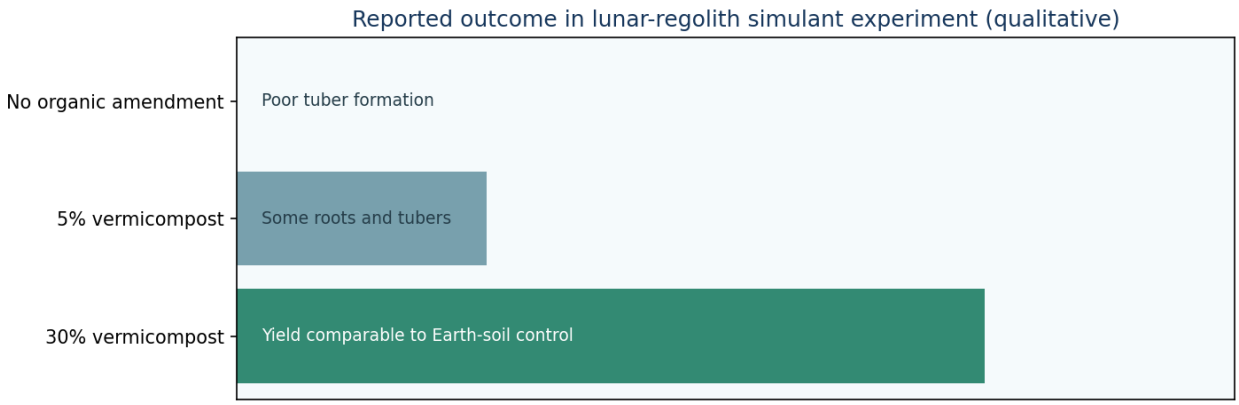
Prelims: the Moon has no Earth-like atmosphere; vermicompost is not a mineral fertiliser; simulant is not returned lunar sample. Way forward: controlled experiments, heavy-metal assays, radiation studies and integrated life-support demonstrations.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

Regolith is the loose fragmented surface material above solid bedrock on airless bodies and elsewhere. Lunar regolith differs from fertile terrestrial soil: it lacks evolved biological organic matter, contains abrasive particles, has unusual mineral chemistry and may include potentially harmful constituents. Vermicompost is stabilised organic material produced with the action of earthworms and microorganisms; it can improve nutrient availability, structure and water retention. A regolith simulant reproduces selected physical or chemical properties, not all lunar environmental stresses. Real lunar cultivation must manage low gravity, radiation, vacuum, temperature extremes, water recycling and closed-loop nutrients.

MULTIDIMENSIONAL MAINS ANALYSIS

Bioregenerative life-support systems could reduce dependence on expensive resupply for prolonged human missions. Crops can provide food, oxygen cycling and psychological benefits. However, edible-biomass safety, contaminant uptake, energy budgets, microbial control and crop diversity remain difficult. Laboratory success is a technology-readiness milestone rather than a proven lunar agricultural system. India’s space ecosystem can benefit from research in controlled-environment agriculture, hydroponics, water recovery and plant stress biology.



Visual 6. Qualitative experimental outcomes, not measured yield data.

News reference:
https://indianexpress.com/article/upsc-current-affairs/upsc-key-shenzhen-peace-treaty-rohingyas-and-air-pollution-10971758/

07. Air pollution: year-round sources and winter amplification

GS linkage: GS-III: pollution; GS-II: public health

WHY IN NEWS

A contemporary analysis emphasised that India's air-pollution problem extends beyond Delhi and winter episodes. Persistent sources include vehicles, industrial processes, thermal power, construction dust, household fuels and waste burning; seasonal crop-residue burning and meteorology can intensify episodes. Weather changes pollutant concentration and dispersion but does not itself create anthropogenic emissions.

KEY POINTS FOR UPSC

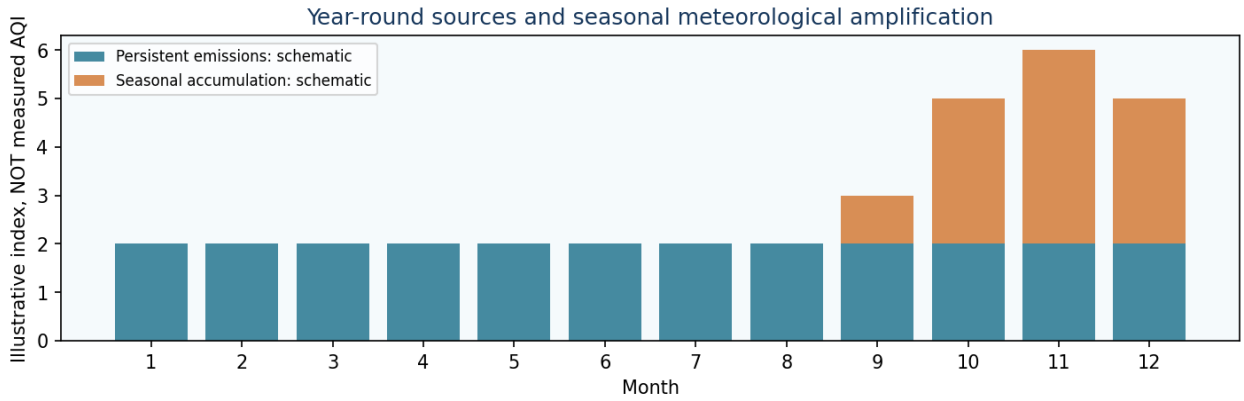
Prelims: AQI is an index, not a pollutant; ozone is beneficial in the stratosphere but harmful near ground. Way forward: airshed plans, clean cooking, industrial enforcement, public transport, dust management, waste segregation and health surveillance.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

Particulate matter PM2.5 denotes particles with aerodynamic diameter up to 2.5 micrometres; PM10 up to 10 micrometres. Ground-level ozone is a secondary pollutant formed through sunlight-driven reactions involving nitrogen oxides and volatile organic compounds. Temperature inversion suppresses vertical mixing; low wind and shallow mixing height worsen accumulation. Emission inventories estimate source emissions; source-apportionment studies estimate contribution to observed concentrations; exposure studies assess what people actually breathe. India's National Clean Air Programme (NCAP) is a city-focused programme, but air-shed pollution crosses municipal and state boundaries.

MULTIDIMENSIONAL MAINS ANALYSIS

Public-health harms include respiratory and cardiovascular disease, impaired child development and lost productivity, with disproportionate impacts on outdoor workers and low-income households. Governance is fragmented among municipalities, transport, agriculture, power, industry and state pollution boards. Technology such as monitors and forecasting is useful but cannot replace enforceable source control. The policy test is sustained reduction in exposure, not a short-term change in displayed AQI after rain.



Visual 7. Conceptual illustration, not observed pollution data.

News reference:
https://indianexpress.com/article/upsc-current-affairs/upsc-key-shenzhen-peace-treaty-rohingyas-and-air-pollution-10971758/

08. Office of profit and legislative disqualification

GS linkage: GS-II: Constitution, representation and ethics

WHY IN NEWS

Recent UPSC coverage revisited the constitutional bar on legislators holding an office of profit under government. The issue protects legislative independence by reducing the risk of executive patronage and conflicts of interest. It is not enough to ask whether an office carries a salary; the legal character of the appointment matters.

KEY POINTS FOR UPSC

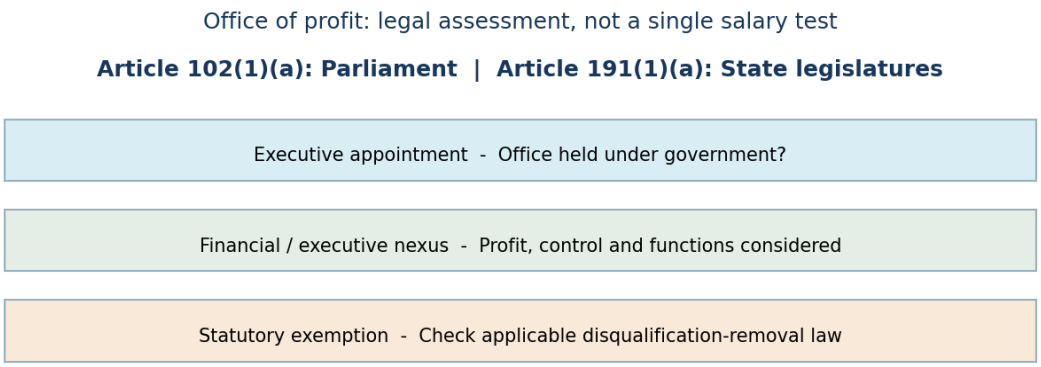
Prelims: distinguish Articles 102/191 from Tenth Schedule; the Election Commission gives an opinion in the constitutional decision process. Way forward: precise exemption laws, public registers of interests and timely adjudication.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

Article 102(1)(a) addresses disqualification of Members of Parliament and Article 191(1)(a) addresses state legislators, subject to statutory exemptions. Articles 103 and 192 specify decision-making processes involving the President or Governor, who act after obtaining the Election Commission's opinion on the relevant disqualification question. Courts have considered appointment, removal, remuneration, functions and degree of government control in evaluating whether an office is under government and carries profit. A statutory exemption can remove a specified office from disqualification. Ministers are constitutionally treated separately for this purpose.

MULTIDIMENSIONAL MAINS ANALYSIS

The underlying concern is separation of powers, legislative scrutiny and public trust. Too broad a prohibition could discourage legislators from useful public functions; too many exemptions could hollow out independence. Ethical safeguards include disclosure of interests, clear role descriptions, objective appointments and transparent remuneration. The question also connects with anti-defection, legislative privilege and conflict-of-interest norms, though these are distinct legal regimes.



Visual 8. Legal tests and constitutional references for office-of-profit disputes.

News reference: https://indianexpress.com/article/upsc-current-affairs/

09. Sustainable aviation fuel at Panipat refinery

GS linkage: GS-III: energy, environment and industrial technology

WHY IN NEWS

Indian Oil's Panipat refinery was reported ready to begin commercial-scale sustainable aviation fuel (SAF) production using used cooking oil, with a stated 30,000-tonne annual capacity and approvals for commercial operations. Reported proposed blending targets should not be confused with an already enacted universal mandate.

KEY POINTS FOR UPSC

Prelims: SAF is not identical to green hydrogen; lifecycle emissions differ from exhaust emissions. Way forward: robust feedstock certification, realistic blending schedules, airline cost-sharing and research in advanced pathways.

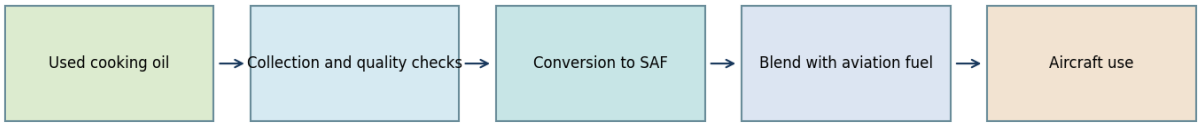
CONCEPTUAL FOUNDATION AND STATIC LINKAGES

SAF is a non-conventional aviation fuel produced from eligible sustainable feedstocks with performance characteristics compatible with conventional aviation turbine fuel (ATF). Certain certified SAF pathways are drop-in blends; compatibility depends on the fuel standard and permitted blending limit. Feedstocks may include used cooking oil, animal fats, selected agricultural residues, municipal waste and other biomass. Hydroprocessed esters and fatty acids (HEFA) is one major pathway. Lifecycle greenhouse-gas savings depend on land-use change, feedstock collection, processing energy, transport and accounting boundaries. Burning SAF still releases CO2 at the aircraft; the potential benefit is lower lifecycle net emissions, not zero tailpipe emissions.

MULTIDIMENSIONAL MAINS ANALYSIS

India can use SAF to develop a waste-to-value supply chain, reduce imported fuel exposure and support hard-to-abate aviation decarbonisation. Constraints include limited authentic used-cooking-oil supply, competing demand, traceability, higher costs and potential food-versus-fuel or biodiversity harms. Strong certification and collection systems are essential to prevent fraudulent feedstocks. SAF complements, rather than replaces, fleet efficiency, demand management and airport electrification.

SAF from used cooking oil: simplified supply-chain stages



Visual 9. Simplified SAF feedstock and fuel-processing stages.

News reference: https://indianexpress.com/article/upsc-current-affairs/upsc-essentials/knowledge-nugget-india-first-sustainable-aviation-fuel-plant-upsc-10968302/

10. Voyager 1 and the one-light-day communication milestone

GS linkage: GS-III: space science and exploration

WHY IN NEWS

Voyager 1, launched by NASA in 1977, was reported to have reached roughly one light-day from Earth in November 2026. A light-day is a distance: the distance travelled by light in 24 hours, about 25.9 billion kilometres. It is not the time taken by the spacecraft to travel that distance. One-way radio signals at that range take about a day, so real-time control is impossible.

KEY POINTS FOR UPSC

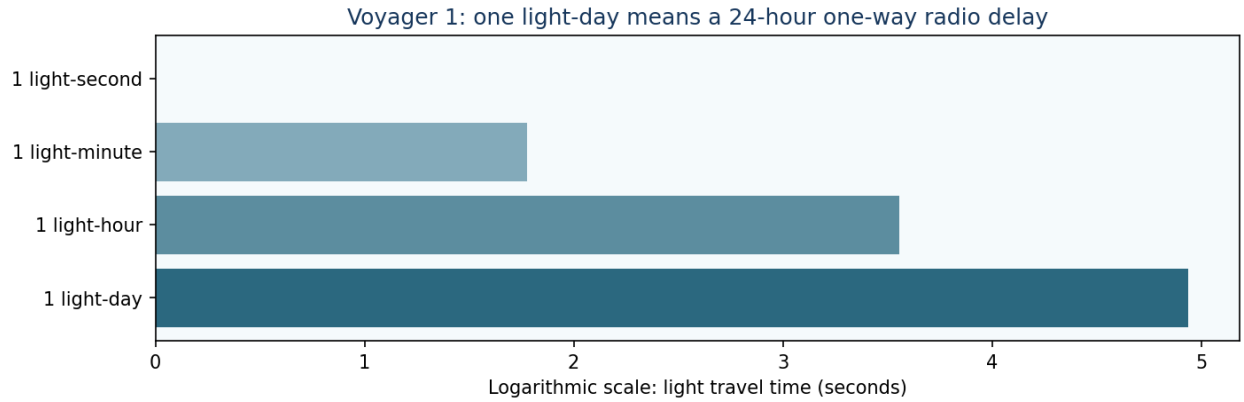
Prelims: a light-year and light-day are distances; DSN is ground-based; Voyager 1 did not visit Uranus or Neptune. Way forward: advanced deep-space communications, autonomous navigation and long-duration instrument reliability.

CONCEPTUAL FOUNDATION AND STATIC LINKAGES

Voyager 1 and Voyager 2 explored outer planets using different trajectories. Voyager 1 entered interstellar space in 2012 and Voyager 2 in 2018, after crossing the heliopause, the boundary at which the solar wind gives way to the interstellar medium. The heliosphere is the bubble shaped by solar plasma and magnetic fields; crossing the heliopause does not mean leaving the Sun’s gravitational influence or the entire solar system in every definition. Voyager 2 alone flew by Uranus and Neptune. Both carry Golden Records with information about Earth. The Deep Space Network (DSN), operated for NASA, has complexes near Goldstone, Madrid and Canberra to maintain communications as Earth rotates.

MULTIDIMENSIONAL MAINS ANALYSIS

The missions transformed knowledge of giant planets, moons, rings, magnetospheres and heliospheric physics. Their longevity illustrates engineering redundancy, radioisotope power systems, fault management and long-duration scientific stewardship. Increasing distance reduces signal strength, while aging power systems require instrument prioritisation. The missions also illuminate the value of patient, basic science investment that may not yield immediate commercial returns.



Visual 10. Light travel time on a logarithmic scale.

News reference:
https://indianexpress.com/article/upsc-current-affairs/upsc-key-shenzhen-international-system-ullas-and-voyager-1-10970278/lite/

GEO IAS

PRELIMS PRACTICE | 10 UPSC-PATTERN MCQs

Choose the correct statement combination. All questions have one defensible answer; explanations discuss every statement.

Q1. With reference to the ICJ and ICC, consider: 1. The ICJ is a principal organ of the United Nations. 2. The ICC prosecutes states for genocide. 3. ICJ contentious judgments bind the parties to that case.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (c) 1 and 3 only. 1 is correct under the UN Charter. 2 is incorrect: the ICC tries individuals, not states. 3 is correct: contentious judgments bind parties, although enforcement is separate. Therefore the correct combination is 1 and 3; options including 2 confuse two institutions.

Q2. Concerning the SCO, consider: 1. Its Charter was signed in 2002. 2. RATS is headquartered in Tashkent. 3. The SCO is a NATO-style collective defence treaty.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (b) 1 and 2 only. 1 is correct: the Charter was signed in 2002 and entered into force in 2003. 2 is correct: the Regional Anti-Terrorist Structure is in Tashkent. 3 is false: the SCO is a regional intergovernmental organisation, not a mutual-defence alliance. Reject combinations containing statement 3.

Q3. Which statements are correct? 1. The Paris Agreement seeks to hold warming well below 2 degrees C. 2. CBDR-RC recognises different national capabilities. 3. A COP draft automatically becomes binding on all parties.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (b) 1 and 2 only. 1 captures the Paris temperature objective, alongside efforts towards 1.5 degrees C. 2 correctly describes common but differentiated responsibilities and respective capabilities. 3 is false: draft text has no automatic legal force and COP outcomes vary in legal character.

Q4. Regarding lunar agriculture, consider: 1. Regolith simulants reproduce selected properties of extraterrestrial surface material. 2. Successful plant growth in a simulant proves crops can grow unprotected on the Moon. 3. Vermicompost can improve nutrient and organic-matter availability.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (c) 1 and 3 only. 1 is true: simulants are Earth-made analogues. 2 is false because lunar radiation, vacuum, temperature and gravity are not replicated fully by a soil-substrate experiment. 3 is true: vermicompost supplies organic amendments and nutrients. This tests the distinction between laboratory feasibility and field validation.

Q5. In air pollution science, consider: 1. PM2.5 denotes particles with diameter up to 2.5 micrometres. 2. Temperature inversion can reduce vertical mixing. 3. Ground-level ozone is always directly emitted from exhaust pipes.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (b) 1 and 2 only. 1 is correct by the standard aerodynamic-diameter convention. 2 is correct: inversion traps pollutants by limiting mixing. 3 is incorrect: ground-level ozone is principally a secondary pollutant formed photochemically from precursors. Do not confuse ozone with directly emitted particulate matter.

Q6. With reference to office of profit, consider: 1. Article 102(1)(a) concerns Members of Parliament. 2. Any unpaid government-associated position necessarily causes disqualification. 3. Parliament may exempt certain offices by law.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (c) 1 and 3 only. 1 is correct. 2 is too absolute: the legal test depends on the nature of office, government control, profit and applicable law, not merely association or salary. 3 is correct because the Constitution permits statutory exemptions. Article 191 deals with state legislators.

Q7. Regarding sustainable aviation fuel, consider: 1. Certain SAF pathways can be blended with conventional aviation fuel. 2. SAF emits no carbon dioxide when burned. 3. Lifecycle emissions depend partly on feedstock and processing.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (c) 1 and 3 only. 1 is correct for certified drop-in SAF blends. 2 is false: SAF combustion releases CO2; potential climate gains arise from lifecycle accounting. 3 is correct: feedstock, land use and production energy determine savings. The phrase zero-emission fuel is a trap.

Q8. About Voyager missions, consider: 1. Voyager 2 visited Uranus and Neptune. 2. The heliopause is the boundary of the Sun’s solar-wind-dominated bubble. 3. A light-day is a unit of time rather than distance.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (b) 1 and 2 only. 1 is correct: Voyager 2 made both flybys. 2 is correct in the physical sense of the solar wind/interstellar boundary. 3 is false: light-day denotes distance travelled by light in a day, approximately 25.9 billion kilometres. Do not confuse light travel time with the distance unit.

Q9. India-Japan security cooperation: 1. A 2+2 ministerial dialogue involves foreign and defence ministers. 2. Quad is a mutual defence alliance with an Article 5 clause. 3. A Letter of Intent always has the legal force of a ratified treaty.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Answer: (a) 1 only. 1 is correct. 2 is false: the Quad is a diplomatic grouping, not a NATO-style treaty alliance. 3 is false: legal effect depends on wording and circumstances, and a Letter of Intent is not automatically a ratified treaty. This is a typical institutional-category trap.

Q10. On nuclear arms control, consider: 1. India is a party to the NPT. 2. New START was a US-Russia strategic arms treaty. 3. The ICC is the principal judicial organ of the UN.

(a) 1 only

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 only

Answer: (d) 2 only. 1 is false: India has not joined the NPT. 2 is true: New START was a bilateral US-Russia framework. 3 is false: the ICJ, not the ICC, is the principal judicial organ of the UN. The only correct statement is 2.

GEO IAS

MAINS MODEL ANSWERS | GS I - IV

GS-I | 15 marks | 250 words

Explain how physical geography and human activities jointly produce severe winter air-pollution episodes in the Indo-Gangetic Plain.

Syllabus / PYQ thematic linkage: Geography: atmospheric circulation, inversion and human-environment interactions. PYQ thematic link: climatic phenomena and urbanisation.

Demand: Distinguish emissions from meteorological accumulation; assess geographic, social and governance dimensions.

INTRODUCTION

Winter air pollution in the Indo-Gangetic Plain is a product of persistent emissions interacting with seasonally unfavourable atmospheric conditions. Geography intensifies the crisis but does not itself generate anthropogenic pollutants.

STRUCTURED BODY

Physical controls: Low winter mixing heights, temperature inversions, weak winds and reduced dispersion allow particulate matter to accumulate near the surface. The Himalayan barrier and regional circulation influence the air-shed, while fog and humidity modify aerosol chemistry. These factors explain why similar emissions can produce worse concentrations in winter.

Human sources: Vehicles, industry, coal combustion, road and construction dust, domestic solid fuels and open waste burning operate through much of the year. Seasonal agricultural-residue burning and heating add episodic loads. Urban sprawl and long commutes increase exposure.

Social dimensions: Children, the elderly, outdoor workers and low-income households face disproportionate exposure; health costs and lost productivity cross administrative boundaries.

CRITICAL ANALYSIS

Treating the problem only as a Delhi winter emergency ignores year-round exposure and emissions transported from neighbouring districts. Temporary restrictions may lower peaks but cannot substitute for structural source control.

WAY FORWARD

Adopt regional air-shed management, clean household energy, industrial monitoring, reliable public transport, dust control and residue-management incentives. Combine emission inventories with source apportionment and health surveillance.

CONCLUSION

Clean air requires geographic understanding translated into coordinated, year-round public policy rather than seasonal crisis management.

GS-II | 15 marks | 250 words

Assess the significance and limitations of multilateral institutions in preventing atrocities and resolving disputes, with reference to the ICJ and regional diplomacy.

Syllabus / PYQ thematic linkage: International institutions, neighbourhood relations and human rights. PYQ thematic link: UN reform and global governance.

Demand: Explain legal competence, enforcement limitations and India-relevant policy choices.

INTRODUCTION

International institutions provide rules, forums and evidence-based procedures that can restrain arbitrary power, but their effectiveness depends on jurisdiction, compliance and political will.

STRUCTURED BODY

Legal accountability: The International Court of Justice decides disputes between states and clarifies obligations under treaties such as the Genocide Convention. Its rulings can establish responsibility, strengthen victim claims and guide reparations. The International Criminal Court, by contrast, concerns individual criminal responsibility.
Diplomatic value: Regional platforms can sustain contact even when bilateral relations deteriorate. Humanitarian agencies support documentation, relief and protection, while multilateral discussions help share the costs of displacement.
India's interests: Stability in Myanmar and Bangladesh, border security, human dignity and the credibility of international law require a calibrated policy balancing security screening with humanitarian access.

CRITICAL ANALYSIS

Courts lack their own enforcement police; states may contest jurisdiction or delay compliance. Diplomatic forums can be paralysed by veto politics, sovereignty disputes and unequal influence. Legal findings alone do not ensure safe return or restore citizenship.

WAY FORWARD

Strengthen evidence preservation, independent monitoring, voluntary and safe repatriation, regional humanitarian coordination and UN institutional reform. Avoid conflating refugee protection with unregulated migration.

CONCLUSION

Multilateralism works best when legal accountability, preventive diplomacy and practical implementation reinforce one another.

GS-III | 15 marks | 250 words

Sustainable aviation fuel is promising but not a complete solution to aviation decarbonisation. Examine.

Syllabus / PYQ thematic linkage: Science and technology; energy security; environmental conservation. PYQ thematic link: clean energy and sustainable development.

Demand: Assess fuel chemistry, lifecycle emissions, economic constraints and a realistic policy mix.

INTRODUCTION

Aviation is difficult to decarbonise because long-haul aircraft need energy-dense fuels. Sustainable aviation fuel (SAF) offers a near-term option for existing aircraft, but its climate performance depends on the entire production chain.

STRUCTURED BODY

Opportunities: Certified SAF can be blended with conventional aviation turbine fuel, reducing the need for immediate fleet replacement. Used cooking oil and some waste residues create circular-economy opportunities. Domestic capacity, including the reported Panipat initiative, may diversify fuel supply and support innovation.
Environmental limits: SAF still releases carbon dioxide during combustion. Its claimed benefits arise from lifecycle accounting and vary with feedstock, land-use change, transport and processing energy. Feedstock competition can threaten food systems and biodiversity.
Economic limits: Limited sustainable raw material, collection costs, certification and higher production prices can constrain scale. Aviation also causes non-CO2 warming effects through nitrogen oxides and contrails.

CRITICAL ANALYSIS

A single blending percentage does not establish actual emissions reduction unless sustainability and accounting rules are credible. Waste oils are finite, and diversion or fraud may undermine benefits.

WAY FORWARD

Build traceable feedstock networks, robust certification, transparent lifecycle accounting, targeted research and predictable blending policy. Pair SAF with efficient aircraft, improved operations and clean airport infrastructure.

CONCLUSION

SAF should be treated as one component of a diversified aviation-transition strategy, not a zero-emission substitute for systemic change.

GS-IV | 20 marks | 250 words

Case study: As district magistrate, you discover that an unlicensed used-cooking-oil collector is supplying adulterated feedstock to a proposed SAF facility. Closing the business immediately may affect hundreds of informal workers. What will you do?

Syllabus / PYQ thematic linkage: Ethics, integrity, public service values, probity and decision-making. PYQ thematic link: conflict between livelihood and public safety.

Demand: Identify stakeholders and competing values; evaluate options; give a reasoned, actionable decision.

INTRODUCTION

The case presents a conflict between environmental integrity, public health, lawful business practices and the livelihoods of vulnerable workers. Administrative convenience cannot justify either ignoring fraud or imposing avoidable hardship.

STRUCTURED BODY

Stakeholders: Informal workers and families, the collector, refinery, airlines, consumers, regulators and the wider public.
Values: Integrity, rule of law, non-maleficence, compassion, proportionality, transparency and accountability.
Option 1 - Ignore violations: Protects short-term jobs but enables fraud, contamination and loss of trust; ethically unacceptable.
Option 2 - Immediate blanket closure without safeguards: May stop unsafe supply but disproportionately harms workers and risks driving operations underground.
Option 3 - Enforce law with a transition plan: Secure samples and records, stop suspect consignments, notify competent regulators, conduct an independent laboratory assessment, give due process and investigate collusion. Simultaneously map workers and arrange temporary income support, training and entry into licensed collection networks.

CRITICAL ANALYSIS

The third approach balances firm action against wrongdoing with procedural fairness and social protection. No political pressure should override laboratory findings; whistle-blowers must be protected.

WAY FORWARD

Create time-bound compliance milestones, traceability records, grievance channels, third-party audits and public reporting of corrective measures. Coordinate with municipal, food-safety and industrial authorities.

CONCLUSION

An ethical administrator is neither indifferent to illegality nor blind to human consequences: lawful enforcement and dignified rehabilitation must proceed together.
