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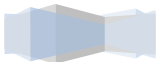
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Q1. India might develop into the world's next space hub. Discuss the successes and difficulties India has faced in realising its space potential.

GS III

Space Technology related issues

• Introduction:

• The Indian space mission has been remarkably daring, ranging from the launch of small rockets with payloads as light as 30-70 kg to the space shuttle's 4,000 kg delivery of cargo. Currently, ISRO is one of the world's top six government space agencies.

• India's potential in the space sector:

• With support from ISRO, the private sector in India's space industry can increase its share of the global space economy from 2% to 8%.

• Most of the restrictions encountered by private players are anticipated to be lifted by the soon-to-be-unveiled new space policy.

• India has the capacity to produce hundreds of space entrepreneurs, and its youth will write the country's destiny (demographic dividend).

• Achievements in the field of space:

• PSLV: First launch vehicle in India to be outfitted with liquid stages, the Polar Satellite Launch Vehicle (PSLV) is the country's third generation launch vehicle.

• Indian space exploration began with the Chandrayaan-1 mission. Even though communication with the spacecraft was lost in 2009, leading to the mission's termination, India's space programme benefited greatly from it.

• The first interplanetary mission from India was the Mars Orbiter Mission (MOM), also known as Mangalyaan. With the mission, India became the first nation in Asia and the fourth worldwide to reach the planet, following NASA, ROSCOSMOS, and the European Space Agency.

• GSLV: Another space launch vehicle intended to place satellites and other spacecraft



into geosynchronous transfer orbits is the Geosynchronous Satellite Launch Vehicle (GSLV). GSLV, a three-stage rocket with strap-on motors, can carry bigger payloads into orbit than PSLV.

- Liquid hydrogen serves as the fuel and liquid oxygen as the oxidizer in cryogenic engines. This technology was exclusive to the US, Japan, France, Russia, and China. India and them are now tied for first place.
- The NETRA Project is an early warning system designed to identify potential threats to Indian satellites in space, such as debris.

• **Issues facing the space industry:**

- **GDP Contribution:** India invests between \$1.5-2 billion in the space industry, however the GDP gain is not commensurate with the amount of money invested.
- **Space Spending:** India continues to trail behind the US, China, and Russia in terms of space spending, according to Economic Survey 2020–21. China spends six times as much on space exploration as India does, despite the US spending ten times more.
- **Grievance Redressal:** The Antrix-Devas aborted satellite agreement demonstrated India's inadequate grievance redressal and dispute settlement mechanisms.
- **Brain Drain:** Every year, thousands of highly qualified engineers leave the country, and many of them immigrate abroad because there aren't enough job prospects there. A 2008 government poll found that 36 percent of NASA's scientists are Indian.
- **Regulatory Issues:** The absence of a stable regulatory framework and policies is impeding private sector participation in the space economy.
- **FDI:** One major obstacle to FDI in the sector is the requirement for sectoral approvals.
- **Way ahead:**
 - Forming new alliances with private business owners and other space organisations.
 - Introducing a business platform that aids in reducing the time needed to create satellites and rocketry in order to achieve first-time right quality for successful launches.



- Less obstacles to entry for private companies and greater synergies between ISRO and private partners would result from improved regulatory clarity.
- allowing the private sector access to ISRO testing facilities.
- The national security policy incorporates the space industry in two ways. It is essential from the standpoint of strategic autonomy and promotes the socioeconomic advancement of the nation. Thus, the space economy needs to take the necessary actions to contain the problems it is facing.

Q2. There are several factors that are endangering India's geographical sovereignty. Analyse. What strategy has India used to address these issues?

GS III

Internal Security

• Introduction:

- India's frontiers are beset by intricate and dynamic security problems that jeopardise the nation's sovereignty and integrity.
- A State can exercise all of its sovereignty over a particular territory thanks to its territorial sovereignty. There are several fronts attacking India's territorial sovereignty, both eastern and western:

• Front of the West:

- Problem with Gilgit-Baltistan: Apparently, in 2020, Pakistan intended to make Gilgit-Baltistan a province in its own right. India disagreed with Pakistan's directive to incorporate Gilgit-Baltistan into the nation's federal system.
- Siachen Issue: With China to the right and Pakistan to the left, Siachen is situated in a very vital area. Therefore, Pakistan reinterpreted the cease-fire agreement to assert its sovereignty over the territory that lies beyond Siachen and the Saltoro Ridge.
- Aksai Chin: China claims this area as part of its autonomous Xinjiang province. Originally, it was a part of the state of J&K. China has governed it since the conflict of 1962. While the Shaksgam Valley (Indian territory granted to China by Pakistan) and the entire Aksai Chin area are claimed by India. This is commonly linked to a recent military conflict in the Galwan Valley.



- India is concerned about the China-Pakistan Economic Corridor (CPEC) and the Belt and Road Initiative (BRI) because they pass through Pakistan-occupied Kashmir, which it believes violates its territorial integrity and sovereignty.

- **Front Eastern:**

- **Problem with Arunachal Pradesh:** China asserts territorial claims over Arunachal Pradesh. It refers to the region as both South Tibet and "Zangnan." The Indian government has categorically denied the Chinese assertions.

- **North East insurgency:** A number of rebel organisations have expressed interest in severing a portion of India's territory and establishing it as a separate nation. The National Socialist Council of Nagalim (NSCN-IM), for instance, asserts that India invaded Nagalim and calls for the division of Arunachal, Nagaland, Assam, and Manipur into the new Greater Nagalim.

- India has implemented a multifaceted strategy to address intricate and ever-changing threats to its territorial sovereignty.

- **Diplomacy:** The Indian Minister of External Affairs has repeatedly said through a variety of diplomatic channels that the dispute between China and India serves no party's interests. Furthermore, to discuss the LAC situation, the relevant foreign ministers of the participating nations convened off-site at the G-20 Summit.

- **Deterrence:** India has increased its military presence on the LAC in an effort to stave off further invasions and to put pressure on China to use force to reestablish the pre-invasion status quo. For instance, following the Galwan Valley Incident, the Indian army took control of Kalatop, a strategically important site in the Pangong Tso region.

- **Strategic Cooperation with Friendly Countries:** The United States of America (USA) promptly provided the defence equipment that New Delhi requested, vocally supported India in its efforts to oppose China's occupation of the disputed territories, and provided India with operational intelligence on Chinese military activities in real time.

- **Fulfilling Aspirations:** In order to redraw and rename the Bodoland Territorial Area District (BTAD) as the Bodoland Territorial Region (BTR) in Assam, the central government, the Assam government, and the Bodo groups—including all factions of the militant National Democratic Front of Bodoland (NDFB)—signed an agreement.



- One can guarantee territorial sovereignty via diplomacy or by having the capacity to prevent war. India is attempting each. We have made efforts to increase deterrence through indigenization and capacity building, but we have also taken various steps to resolve the unresolved issues diplomatically. We need to concentrate more on finding early solutions to these problems if India is to grow into a global force and avoid being isolated in South Asia.

Q 3. Discuss the difficulties that sugarcane farmers have recently faced. What steps may be made to deal with these issues?

GS III

Indian Agriculture

• Introduction:

• A vital crop for the nation's economy, sugarcane makes for 10% of all agricultural production. India surpassed Brazil to become the world's leading producer of sugar in 2021–2022. In addition, the nation consumes the most sugar globally. Exports have increased as a result of favourable legislative initiatives to encourage farmers to grow surplus sugarcane, setting a record of 110 lakh tonnes exported in 2021–2022. Farmers who grow sugarcane still have a lot of obstacles to overcome.

• The following are obstacles that sugarcane farmers must overcome:

• **Water availability:** Top-growing states receive only 1,000–1,200 mm of rainfall annually, despite sugarcane being a water-intensive crop that needs 3,000 mm of rainfall. Because of this, there are worries about groundwater depletion in these states because they mainly rely on groundwater for irrigation.

• **High Investment:** The cultivation of sugarcane involves a significant financial outlay for farmers, who must prepare the fields by tilling, levelling, and preparing the soil in order to plant sugarcane. Additional high labour costs during the cutting season have a detrimental effect on farmers that grow sugarcane.

• **Overproduction:** One of the most lucrative cash crops for farmers in the majority of India is sugarcane. As a result, during the 2021–22 season, India produced record amounts of sugarcane—over 5,000 million tonnes. Farmers now pay more for storage and shipping as a result of this. Moreover, sugar mills are having difficulty paying farmers what they owe.



- **Low Sugarcane output:** Compared to other of the major sugarcane-producing countries in the world, India's output per hectare is extremely low. For instance, India produces only 64.5 tons/hectare, compared to 121 tonnes in Hawaii and 90 tonnes in Java.
- **Problems with the cane reservation area:** Under the terms of the arrangement, mills that are designated as such are required to buy from cane farmers inside their specified cane reservation area, and farmers are required to sell to the mills within that specific area. Farmers' ability to bargain with mill owners for higher prices has suffered as a result.
- **Impacts of the climate:** India experienced an intense heatwave in 2022, marking the hottest March in the previous 122 years. The quality of the sugarcane juice and the finished sugar product as a whole are both negatively impacted by intense heat or extreme cold. Over 35°C to 40°C temperatures cause the sugarcane crop to develop more slowly and produce less in total.
- **Low Sugar Recovery Rate:** India's average rate of recovering sugar from sugarcane is less than 10%, which is extremely low when compared to other major countries that produce sugar.
- The following actions can be made to address the aforementioned difficulties:
 - **Changing to less resource-intensive incentive crops:** Analysing and then adjusting incentives that favour sugarcane over other crops would be a better and more sustainable approach. A fair and thorough crop subsidy programme can assist farmers in diversifying their crops, distributing cultivation equally, avoiding monocultures, and guaranteeing a fair income.
 - **Encouraging mechanisation:** Given the high manpower costs, mechanisation in sugarcane fields should be encouraged by the government providing subsidies for the purchase of machinery to plant sugarcane stems and to harvest and de-weed them. Farmers can rent them in the village once they're available, just like they can with tractors and crushing machines.
 - **Production of sugarcane that is environmentally sustainable:** To address the problem over time, emphasis should be placed on encouraging agricultural techniques such drip irrigation. Drip irrigation can save up to 70% of the water used in flood irrigation by allowing water to drip gently and directly to the roots of sugarcane plants.



- Applying the recommendations of the Rangarajan Committee: The Committee suggested that states gradually phase down cane reservation areas and bonding and promote the creation of long-term contractual arrangements based on the market. Farmers would have the freedom to choose which mill to sell their produce to thanks to these customised contracts.
- Conversion of excess sugar to ethanol: Under the Ethanol Blended Petrol (EBP) Programme, Oil Marketing Companies (OMCs) are allowed to sell petrol that has been up to 10% blended with ethanol. Ethanol production from surplus sugar will increase liquidity and stop the decline in sugar prices.
- The Sustainable Sugarcane Initiative, the Ethanol Blending Programme, and Fair and Remunerative Prices (FRP) are just a few of the steps the government has taken to safeguard the interests of sugarcane farmers. However, tackling the problems faced by sugarcane growers holistically will require addressing structural concerns and introducing long-term solutions.

Q4. What are Essential Minerals? Give some insight into the importance of essential minerals for a nation's development.

GS III

Indian Economy related issues

• Introduction:

• When a mineral's supply shortfall risk and the ensuing economic impact are larger than those of other raw resources, the mineral is classified as essential. These minerals are necessary for a nation's economic growth and security on the international stage. The scarcity of these minerals or their concentration in a small number of geographic areas for processing or extraction could create vulnerabilities in the supply chain or possibly cause an interruption in supplies. Thirty essential minerals, including lithium, cobalt, nickel, graphite, tin, and copper, have recently been recognised by the government. These minerals will be essential to the expansion and advancement of the economy's many sectors.

• Elements influencing criticality:

• Critical minerals are important for the growth and development of a nation because they include:



- **Economic significance:** Essential minerals are important to many different areas of the economy. This covers industries including semiconductors, advanced manufacturing inputs, information and communication technology, and materials used in defence, ceramics, permanent magnets, and other materials.
- **Transition to electric vehicles:** The demand for vital minerals like cobalt, nickel, lithium, and rare earth elements is skyrocketing due to the quick increase in the use of electric vehicles. By 2030, the government wants to see 30% of private automobile sales, 70% of commercial vehicles, and 80% of two- and three-wheelers be electric. Thus, reaching these goals requires a steady supply of essential minerals.
- **Boosting self-reliance:** The government's Made in India, Smart City, Atmanirbhar Bharat, 100 GW renewable energy target, and Production Linked Incentive (PLI) plans are expected to dramatically increase India's demand for essential minerals. Achieving these objectives will require critical minerals in large amounts.
- **Clean energy technologies:** It's critical to expand component manufacturing operations for solar panels, wind turbines, and other components as India works to develop these technologies domestically. In light of this, essential minerals are important for fulfilling the "Net Zero" goal and making the shift to an economy with lower carbon emissions.
- **Building supply chains:** India's competitive value chains will only be possible if mineral wealth is found and areas of its potential are identified through the application of cutting-edge technologies.
- **Reducing reliance on imports:** By identifying and exploring essential minerals, the nation may better prepare for the purchase and protection of these mineral assets while keeping in mind its long-term needs. This will further lessen India's reliance on imports, as the country is entirely dependent on imports from China, Russia, Australia, South Africa, and the United States for the supply of vital minerals including tantalum, lithium, cobalt, nickel, niobium, beryllium, and nickel.
- **National security:** Because critical minerals can carry out intricate tasks and endure harsh environments, they are essential for use in space, defence, aerospace, and nuclear applications. They are also crucial for attaining self-reliance in the defence industry and guaranteeing defence readiness.
- **India has thus turned its attention to crucial minerals as a result of realising that two processes must occur simultaneously for the country to experience future economic progress. The first is raising living standards and locating production in key industries; the second is increasing investment in sustainable growth, energy, and lifestyle models by concentrating on decarbonization.**



Q 5. What are the consequences of a widening current account deficit? "The unfavourable global economic situation has placed India's balance of payments under pressure and has led to the widening of the current account deficit (CAD)". Discuss the causes of the elevated CAD as well.

GS III

Economy related issues

• Introduction:

• One part of a nation's balance of payments (BOP) is its current account. It keeps track of the products and services that a nation imports and exports. A country's trade is measured by its current account deficit (CAD), which occurs when the value of the goods and services it purchases is more than the value of the products it exports. At 4.4% of GDP, India's CAD is at a nine-year high. The Economic Survey 2022–2023 emphasised the importance of closely monitoring India's CAD.

• Consequences of growing CAD:

- Depreciation of the rupee: As the current account deficit widens, the rupee will face more pressure to appreciate relative to the US dollar. The rupee has lost more than 8% of its value in relation to the US currency this fiscal year.
- Costlier imports: As the rupee's value declines, imports become more expensive. India imports expensive goods and commodities, such as semiconductors, electrical equipment, and crude oil. As a result, the exchequer is facing an increasing burden, which is driving up the current account deficit.
- Depletion of Forex: The depletion of foreign exchange reserves is a consequence of the expanding CAD and the depreciation of the rupee. The Deloitte research claims that as a result of outflows of foreign institutional investment (FII), India's foreign exchange reserves fell from 13 months' worth of import cover at the start of 2021 to eight months.
- The spike in imported inflation can be attributed to various factors, including the escalation of oil costs and the disruption of global supply chains caused by the conflict between Russia and Ukraine.

• CAD has increased due to the following factors:

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- Recession in other nations: India's current account will go worse if the major trading partners expand their economies negatively and purchase fewer of our exports.
- High inflation: India's exports may become less competitive and imports more competitive if its inflation rate increases more quickly than that of its principal rivals. Elevated inflation causes the current account to worsen.
- Economic Growth: As the national income rises, people typically have more money available to them to spend on things. Consequently, a considerable rise in imports could result from increasing levels of disposable income.
- Global demand: According to IMF projections, growth will slow down globally in 2022 and 2023. Reduced demand worldwide damages India's exports of goods.
- Competition in exports: South Asian nations are a rival for India in a few of its competitive export goods. Vietnam and Bangladesh are known to have increased their textile exports to other countries in recent years. This will have an effect on India's export revenue.
- The expansion of CAD is a chronic issue that calls for a thoughtful strategy. Correcting supply-side constraints, boosting exports, reducing non-essential imports, and monitoring rupee volatility are a few ways to address the current account deficit.

Q 6. "Green Growth" has been identified as one of the key priorities in the Union Budget 2023. Talk about the key tenets of the budget's quest for green growth.

GS III

Economy related issues

• Introduction:

• Green growth is the process of promoting economic expansion and development while preserving the resources and environmental services that nature provides that are essential to our survival. One of this year's seven budget goals is "Green Growth," citing India's efforts to achieve net zero carbon emissions by 2070 as a means of launching a green industrial and economic revolution.

• The primary constituents of Budget's green growth initiative are:





- The Green Hydrogen Mission aims to lower reliance on imported fossil fuels, accelerate the economy's shift to a low-carbon economy, and establish the nation as a leader in both technology and market share in this emerging industry.
- PM-PRANAM initiative: To encourage States and Union Territories to support alternative fertilisers and the balanced use of chemical fertilisers, a new "PM Programme for Restoration, Awareness, Nourishment and Amelioration of Mother Earth" would be introduced.
- GOBARdhan scheme: To encourage a circular economy, 500 new "waste to wealth" units will be built as part of the GOBARdhan (Galvanising Organic Bio-Agro Resources Dhan) scheme.
- It focuses on handling and producing compost, biogas, and bio-CNG from solid waste and animal dung on farms.
- These will consist of 300 community- or cluster-based plants and 200 compressed biogas (CBG) plants, of which 75 will be located in urban areas.
- Bhartiya Prakritik Kheti Bio-Input Resource Centres: 10,000 Bio-Input Resource Centres will be established nationwide to support the adoption of natural farming by one crore farmers over the course of the next three years. This will provide a distributed network for the production of pesticides and micro-fertilizers at the national level.
- The "Mangrove Initiative for Shoreline Habitats & Tangible Incomes" (MISHTI) initiative was introduced in order to build on India's achievements in afforestation.
- With the help of the Compensatory Afforestation Fund Management and Planning Authority (CAMPA) Fund, MGNREGS, and other sources, it will concentrate on mangrove plantations along the coast and salt pan lands.
- Wetlands are essential habitats that support biological diversity, according to Amrit Dharohar. Through the Amrit Dharohar programme, the government will promote their distinctive conservation values.
- This will be put into practise over the course of the following three years in an effort to promote the best possible use of wetlands and improve potential for ecotourism, carbon storage, biodiversity, and local community revenue production.
- Coastal Shipping: Using PPP mode and viability gap finance, coastal shipping will be marketed as the more affordable and energy-efficient form of transportation for both passengers and goods.



- **Vehicle replacement:** Getting rid of outdated, environmentally harmful cars is crucial to turning our economy green. Funds were allotted to scrap Central Government vehicles in support of the auto scrapping strategy outlined in Budget 2021–2022. States will receive assistance in swapping out their outdated cars and ambulances.
- **Evacuation of renewable energy:** Re-evacuation enables the quick evacuation of generated power to the power system for distribution. It will be necessary to build an interstate transmission line in order to evacuate and integrate 13 gigawatts of renewable energy from Ladakh into the grid.
- **Green Credit Programme:** In accordance with the Environment Protection Act of 1986, a Green Credit Programme will be announced in order to promote behavioural change.
- This will encourage businesses, people, and local governments to take ecologically responsible and responsive activities.
- As a result, the projects listed above are in line with India's Panchamrita targets that were declared during COP26. They will contribute to reaching net zero by 2070, lowering carbon intensity, increasing the use of non-fossil energy, and increasing the push towards renewable energy.

Q 7. Although the Right to Information (RTI) Act is regarded as a sunshine law, it is not without difficulties. Examine the statement while highlighting the modifications made by the RTI (Amendment) Act 2019.

GS II

Government Policies and Interventions

•Introduction:

•The parliament passed the Right to Information (RTI) Act, granting residents the right to timely requests for information from public offices. RTI is regarded as "sunshine legislation" since it has replaced the culture of secrecy in government offices with one of openness and disclosure.

•**The RTI Act fulfils the function of sunshine laws in the following ways:**





- Through the establishment of a grievance redressal procedure, a public information officer in every public agency, and a set time limit for information provision, RTI has institutionalised openness.
 - In addition to preventing RTI petitions from becoming an administrative burden, proactive disclosures made possible by suo moto disclosures under Section 4 of the RTI have increased transparency in public offices.
 - A more engaged populace with the ability to hold government entities responsible for providing entitlements like public services, pensions, scholarships, and so on has been made possible by RTI.
 - RTI has aided in exposing corruption, including the 2G and Adarsh Society scams.
 - Civil society organisations now have more momentum to hold the government accountable for improving the lives of the impoverished by being transparent about its spending and results thanks to RTI.
- Notwithstanding RTI's positive effects as a sunshine law, the Act nonetheless faces the following difficulties:**
- Because the RTI (Amendment) Act 2019 subjects the terms of Central and State ICs' offices to Union executive regulations rather than legislative restrictions, it has weakened their independence.
 - The Act grants the federal government the authority to announce tenure and salary changes, which could result in the arbitrary termination, postponement, or allure of pay adjustments. The ICs may become more politicised as a result.
 - Federal spirit is violated when SICs are under central government control. It might turn SICs from watchdogs for transparency into handmaidens of the centre.
 - Due to PIOs' rejection of information, there are a lot of appeals pending before the ICs. ICs are frequently observed to be sympathetic to the officials. Decisions made by the CIC are still not being enforced because of legal challenges.
 - It is difficult to protect whistleblowers. Since the Act's passage in 2005, more than 85 RTI advocates have died, according to the Commonwealth Human Rights Initiative.



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- The RTI's section 8's national security exception is frequently applied as a general standard to deny requests for information. Additionally, pointless requests often overload government agencies, making it difficult for them to complete routine administrative tasks.
 - The administrative culture of secrecy has changed as a result of RTI, but considerable work needs to be done to maintain the culture of transparency. The 2nd ARC proposed that public officials take an oath of transparency, and that government intervention in transparency be limited to protect institutional autonomy.

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