IAS BABA

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Phase 2 - Compilation

Part 2

GS 3

1. The case for privatising India's public sector banks is ultimately a case for economic development. Elucidate.

Approach

Candidate can start the answer with highlighting recent reference for the privatisation and try explain the basic part of the privatisation and then explain how it will lead to economic development and also mention some disadvantage and challenge.

Introduction

The government is in the process of taking 'advanced action' to take forward the privatisation of public sector banks, top finance ministry officials asserted. Even as the NITI Aayog has suggested names of two PSBs for privatisation, the Centre is yet to make an enabling provision in the law for the divestment of the government's stake sale below the 51 per cent threshold.

Body

Privatisation:
* India went for privatisation in the historic reforms budget of 1991, also known as 'New Economic Policy or LPG policy'. The transfer of ownership, property or business from the government to the private sector is termed privatisation.
* Privatisation is considered to bring more efficiency and objectivity to the company, something that a government company is not concerned about.

Privatisation of India's Public sector banks is a step towards the economic development:

* Lack of Autonomy: Public sector bank boards are still not adequately professionalized, as the government still decides board appointments (as the Bank Bureau board is not fully functional). This creates an issue of politicization and interference in the normal functioning of Banks.
* Bulk of NPAs: The banking system is overburdened with the non-performing assets (NPAs) and the majority of which lies in the public sector banks.
* Better regulation than the government: Privatization of banks lessens the burden of responsibility from the government as the private banks are more restricted in dealing with loans and frauds.
* Benefitted by foreign investments: The foreign investors prefer investing g in private banks as compared to the public sector banks.
* Better advancement: The banks that belong to the private sector are wellmanaged and better advanced than then public sector banks and are popular for their operational efficiency.

- Profitable venture: There are many public sector undertakings that are stagnant are not belong able to earn profited from the business. The government has therefore decided to privatize the public sector undertaking banks and save them from suffering severe losses in the future therebyhelpingthem to make profitable and sustainable business.
- For example, Private banks are profit-driven whereas the business of PSBs is disrupted by governments schemes like farm loan waivers etc.
- Also, in the private sector, the shareholders' effective control over banks may explain the absence of large-scale frauds like in public sector banks such as the Punjab National Bank episode.
- Efficiency, financial prudence and governance: Also, privatizing a few loss-making PSBs will ensure that market discipline forces them to rectify their strategy, and this will have a ripple effect on other PSBs. Better financial performance is ensured when a strong financial institution is involved as a significant shareholder in privatization.
- Private Participation promotes innovation in market: Private Banks' market share in loans has risen to 36% in 2020 from 21.26% in 2015, while public sector banks' share has fallen to 59.8% from 74.28%. They have expanded the market share through new innovative products, latest technology, and better services.

Disadvantages of Privatization

- There are high chances of some private players taking in the lead and creating a monopoly market in their favor.
- As the main motive of private companies is profit generation, they are not advisable in social sectors like health, education, etc. Which should be non-profit oriented.
- Private business players, to increase their immediate profits, may be reluctant to invest in long-term projects.
- The industries which are privatized may become fragmented, with no person taking responsibility in their hands.
- They may not cater to vulnerable and marginalized sections
- Certain strategic sectors cannot be privatized due to security and strategic concerns.

Way Forward

- Privatise only non-functioning PSBs.
- Strengthen RBI's regulation over PSBs.
- Implement Kotak committee recommendation of corporate governance.
- Conversion of PSBs into corporations like Life Insurance Corporation (LIC).
- Improve NPA recovery, reduce loan defaults and introduce greater transparency in credit allocation.

Conclusion

Privatization of banks improves the bank efficiency, the benefits become greater when the government leaves its control over the banks. When the banks get privatize to different strategic investors, foreign banks participate in the privatization process in which the government never interferes. Hence, the competition is not restricted.

2. What are the potential and challenges of an export oriented strategy for industrial growth? Critically analyse.

Approach

Candidate can briefly explain the export oriented growth strategy followed by its relation with the industrial growth. Challenges involved in this strategy can be highlighted along with the way ahead.

Introduction

Export-led growth occurs when a country seeks economic development by engaging in international trade. Export-led growth has a lot to do with self-sufficiency. The last 40 or so years have been dominated by what has come to be known as export-led growth or export promotion strategies for industrialization, at least when it comes to matters of economic development.

Body

Export oriented growth strategy

- An export-led growth strategy is one where a country seeks economic development by opening itself up to international trade.
- The opposite of an export-led growth strategy is import substitution, where countries strive to become self-sufficient by developing their own industries.
- By the 1980s, many developing nations liberalized trade and began to adopt the export-oriented model in lieu of import substitution.
- The period between 1970 to 1985 saw the adoption of the export-led growth paradigm by the East Asian Tigers.

Export oriented growth strategy and industrial growth

- Growing export sales provide revenues and profits for businesses which can then feed through to an increase in capital investment spending through the accelerator effect. Higher investment increases a country's productive capacity which then increases the potential for exports.

- Many industries help facilitate trade such as trade insurance, logistics and port facilities. Countries with fast-growing export sectors are likely to see increased investment and employment in these related industries. A good example is the importance of trade to countries such as the Netherlands (including the port of Rotterdam), and Singapore and Hong Kong both of which have developed in globally-scaled hubs for trade.
- India's big, unexploited opportunities are in unskilled labour exports. India is vastly under-exporting relative to its labour force.
- As India contemplates atmanirbharta, two deeper advantages of export orientation are always worth remembering. 1) Foreign demand will always be bigger than domestic demand for any country. 2) If domestic producers are competitive internationally, they will be competitive domestically and domestic consumers and firms will also benefit.

Challenges

- Focusing on exporting might lead to over-dependence on the economic cycles of trade partner countries and vulnerability to external economic and political shocks.
- Running persistent trade surpluses might incite a protectionist response from other nations who feel that the benefits of trade have been unequally skewed in favour of exporting countries. Huge trade imbalances remain a big concern in the global economic system.
- Production capacity allocated to supply goods and services for export cannot be put to use meeting domestic needs and wants. There might be a consequent dip in domestic living standards unless the country is also prepared to import goods and services using the revenue generated from exporting.
- Rapid export-led growth might lead to demand pull inflation and higher interest rates. High relative inflation might then have the effect of making export industries less competitive in overseas markets and domestic producers less price competitive against imports.
- Export-led growth might be unsustainable if it contributes extraction of natural resources beyond what is required for long term balanced growth to be maintained.

What can be done?

- Addressing Structural Issues: All countries that promoted export-led growth invested heavily in human capital and ensured very good infrastructure with ports, roads, airports and railways. Thus, India needs to: Invest in its labour force and provide them with regular, affordable food supply and housing. Build a well- functioning infrastructure and take various trade facilitation measures like easier customs clearances, less paperwork.
- Economic Decentralisation: There is also the need for economic planning to be devolved lower and lower down all levels of government so that people

are empowered to take up an economic activity that suits them and develop the resilience needed to respond to new opportunities and threats.

- Providing Easy Credit: Providing easy credit remains a critical aspect of mobilising investment. Hence, India also needs cleaning up of the Non-Performing Assets. In this context, the privatisation of banks will be a step in the right direction.

Conclusion

While export-led growth has been the dominant economic development model since the 1970s, there are signs that its effectiveness may be exhausted. The export paradigm depends upon foreign demand and, since the global financial crisis in 2008, developed nations have not regained strength to be the main supplier for global demand. It looks like a new development strategy will be needed, one that will encourage domestic demand and a better balance between exports and imports.

3. In recent months many big startups including unicorns have laid off workers, what is causing the stress among start ups in India ?Analyse.

Approach-

A simple straightforward question where candidates are expected to write about why Indian start ups including some unicorns have recently laid of workers ,in second part of answer write about what problems Indian start ups are currently facing . Analyse.

Introduction -

Since last few months many startups and unicorns made employees redundant and shown the door of late. And its mostly the startups which have wielded the axe. From the european crisis and the recession to inflation and the pandemic, the factors behind the widespread layoffs are not just limited but seemingly obscure .With the funding environment deteriorating, even well-funded start-ups have started downsizing their teams .

Body

Until the last few months, the funding for start-ups was blooming, having reached record highs in the first quarter of 2022. As per Inc42 data, Indian start-ups raised more than $11.8 billion across 506 funding deals in Q1 2022.
- This is higher than the total annual funding raised in the year 2020 and 186 per cent more than in the same period last year,

- Over 23,000 employees in startups have lost their jobs since the pandemic began in 2020, making India among the top five countries in terms of startup layoffs, a crowd-source database shows. In the past few months, almost 2,594 employees have been laid off across multiple start-ups

- The helicopter money that some of the venture capitalists (VCs) and early start-ups were enjoying will now see a decline with the incoming hyperinflation and stagflation, as the bubble is about to get popped. The start-ups are hence resorting to shedding flab by axing employees and thus, cutting back on employee-expenditure costs.

- The latest is Cars24, which has laid off 600 employees, citing performance-related issues.

- This is nothing new in a business cycle and has happened before with some insiders having foreseen the recent layoffs in last year's projections. The IT industry is one of the sectors that has been hit badly.

- Every company is now at some level trying to reprioritise where they are investing against where they are burning cash. When capital is abundant, there is hope that, no matter what, more capital will keep coming. At that time, these prioritisation questions can sometimes take a backseat. But now there is a lot of focus on company building and identifying what matters for the business."

- when companies are not able to raise capital, the next thing they will look for is consolidation. Bansal also noted that the funding crunch can even result in valuation corrections for cash-guzzling companies that were valued on metrics rather than actual revenues or potential cash-flows.

- Things are not as bright for the Indian startup ecosystem as they were last year. The segment which thrived during the pandemic is now facing the brunt of Russia-Ukraine war which led to inflation and liquidity crunch – denting the capital raising ability of startups. The investors are getting more selective, and more tight fisted.

- Currently, the external environment is tough. War in Europe, impending recession fears, and Fed rate interest hikes have led to inflationary pressures with massive correction in stocks globally and in India as well. Given this environment, capital will be scarce in upcoming quarters.

- The venture capital world is putting through a paradigm shift from edtech and health tech to gaming and block chain. Byjus recently announced plans to enhance focus on the international markets as the Indian edtech market is scaling down.

- Industry experts say that at least 50,000 more startup employees are likely to be thrown out this year alone in the name of "restructuring and cost management" while certain startups keep receiving millions in funding's.

- Indian startups miscarried capital, flying the coop over the creation of sustainable capital reserves. High cash burn and jerry-built capital allotment also helped drive startups to the wall.

- Amidst growing pressure from investors to stick to conventional profit-making, firms should essentially get the hang of operating tenably to eke out an existence during the funding winter. Investors have continued to advise against exploring and venturing into new market verticals.

- Enclosed by the icy funding season which is speculated to last 12-18 months, focusing on unit economics may also be the answer for the struggling startups. The said cost-cutting alternative would be a win-win, helping employers curtail expenses and saving employees from the dreadful layoffs.

Why the layoffs?

- The late-stage funding is becoming slow for start-ups, and it will dwindle out eventually. Investors want the companies to go back to the basics, to the traditional ways of making profit rather than negative cash burning.
- They want to have a more profound role in the accountability and operation of these businesses.
- Another reason that is cited by the experts is the issue of over-hiring. Companies spent a lot of their funds investing on workforce resources during the pandemic, majorly focusing on the requirements and the demands of the curfew period.
- As the world opens up, their plans have shifted to accommodate the requirements of the open world. The massive pay hikes and hiring sprees are now hurting the companies, costing them a lot of funds over maintaining their workforce and is an easy explanation for why these companies are sacking a lot of their employees.
- The major reason for the layoffs is unplanned hiring… usually start-ups are in a rush to on-board talent that might be of no use after some time. Such layoffs and a toxic culture create conflicts and communication issues which later affects the mental health of the employees.
- This follows layoffs at several other start-ups, including some well-known Unicorns in the recent past.However, experts feel the trend of companies rationalizing their business verticals and burn rates by trimming down their workforce is likely to not only continue but may accelerate in the near future.
- Start-up investors also said that the lack of funds may even result in consolidation and an increase in demand for venture debt. In the past few months, almost 2,594 employees have been laid off across multiple start-ups, including unicorns such as Cars24, Unacademy, Meesho, and Vedantu, according to a BL estimate.
- Unacademy and Meesho said that the layoffs were done due to role redundancy. whereas, Vedantu CEO Vamsi Krishna penned down a note to say this will help the company build a longer capital runway given the uncertainties of the outside world and tightening of capital availability.
- The layoffs come as the edtech sector has been hammered by the global macroeconomic conditions and reopening of schools, colleges and physical tuition centres.
- The layoffs are not just exclusive to the IT companies and are affecting every sector. Online gaming sector, a social e-commerce platform, another social e-commerce platform, furniture rental company, laying off hundreds of its employees from their respective organisation.

Conclusion

The hire and fire policy adopted by a lot of these online start-ups will be detrimental to the growth of these start ups in the country. Due to inflation and other market-related factors, many online start-ups are laying off employees. However, this is a temporary phenomenon and these new age start ups have huge potential for future growth as start up culture in India unlocking its potential .

4. Do you think the depreciating Rupee is a cause of serious concern for the Indian economy? Contextualise your response.

Approach

Candidate can start with basic information on the depreciation of the currency and explain some serious concerns related to it in economy with proper contextualization with examples.

Introduction

Currency depreciation is a fall in the value of a currency in a floating exchange rate system. Rupee depreciation means that the rupee has become less valuable with respect to the dollar. It means that the rupee is now weaker than what it used to be earlier.

Body

What determines the rupee's value:

- The value of any currency is determined by demand for the currency as well as its supply.
- When the supply of a currency increases, its value drops.
- In the wider economy, central banks determine the supply of currencies, while the demand for currencies depends on the amount of goods and services produced in the economy.
- For example: USD 1 used to equal to Rs. 70, now USD 1 is equal to Rs. 77, implying that the rupee has depreciated relative to the dollar i.e. it takes more rupees to purchase a dollar.

Depreciation a concern for economy:

- The current account deficit is bound to widen, depleting foreign exchange reserves and weakening the rupee.
- With higher landed prices of crude oil and other crucial imports, the economy is definitely inching towards cost-push inflation.

- Cost-push inflation (also known as wage-push inflation) occurs when overall prices increase (inflation) due to increases in the cost of wages and raw materials.
- Companies may not be allowed to fully pass on the burden of high costs to consumers, which, in turn, affects government dividend earnings, raising questions about budgeted fiscal deficits.
- Ripple effects – Crude oil price hikes increases the cost of transportation of goods being transported by road, including food items, it creates ripple effects on rising food inflation in the country.
- Similarly, imported products like electrical machinery, mechanical appliances, precious metals (like gold), etc., that India imports will also become more expensive.
- India's current account deficit is expected to hit a 10-year high of 3.3% of GDP in the current financial year. The import bill has been rising due to high oil prices since the Russian invasion of Ukraine. The war has also resulted in steep rise in prices of other commodities which has made the situation worse.
- Plunging markets: The US Federal Reserve's decision to tighten the monetary policy and hike interest rates has led foreign portfolio investors (FPI) to pull out Rs 168,000 crore since January 2022.
- Sectors most affected: Auto, real estate, and infrastructure sectors would be worst hit whereas IT and banks will be impacted positively.
- Students abroad: Travellers and students studying abroad will have to shell out more rupees to buy dollars from banks.
- Reduction in Purchasing Power Parity: One of the outcomes of a depreciating rupee will be the rise in inflation in the economy. When the inflation rises, prices of goods and commodities shoots up. Therefore, the purchasing power of the rupee falls down.

Benefits of Rupee Depreciation:

- Advantage to Exporters: Weakening of rupee gives up a huge advantage to the exporters. Let's take up an example to understand this point. Suppose, an exporter exported goods to US and his receivable payment is 100 USD. Let's take the value of 1 USD = Rs. 55 at the time of trade.
- So, his net receivable will be Rs. 5500. Suddenly, at the time of payment if the rupee declines sharply in terms of dollar and let's takes 1USD at that time becomes Rs. 57. So, at the time of payment the exporter will get Rupees 5700 of the same trade due to the currency fluctuation.
- Therefore, his net profit due to depreciation of rupee becomes Rs. 200. This is how the exporters are benefited.
- Boom to tourism industry: Travel and tourism is a sector which will benefit from the depreciation of the rupee. Let's take up an example again to understand how this industry will benefit. Suppose, if a trip to India costs Rs. 1,00,000 to a foreigner and the dollar is quoting 1USD = Rs.50 at that time.

- So, the trip would cost the foreigner 2000 USD. If the rupee declines in front of dollar and suppose it quotes at 1USD = Rs. 60. Then the same trip would cost the foreigner approx. 1666 USD.
- This will entice foreigners to visit India and help increase revenues through the travel and tourism industry.

Conclusion

Relief is possible only if the dollar index cools off. Hence, the rupee can be seen as weak till the time it's below 76.50 and it can touch 78 in the coming sessions, which might create fresh short unwinding in the dollar, making the rupee even weaker.

5. What is E-AMRIT initiative? Discuss its significance.

Approach

Question is straight forward. Candidate can explain in detail the background of e-amrit initiative followed by the design of initiative. Significance of the initiative can be underlined along with the conclusion.

Introduction

E-Amrit is a one-stop destination for all information on electric vehicles—busting myths around the adoption of EVs, their purchase, investment opportunities, policies, subsidies, etc. The portal has been developed and hosted by NITI Aayog under a collaborative knowledge exchange programme with the UK government and as part of the UK–India Joint Roadmap 2030, signed by the Prime Ministers of the two countries.

Body

What is E-amrit initiative?

- The e-AMRIT portal aims at creating awareness about electric mobility in India. It has been developed as a 'one-stop site' for all the information related to the adoption of electric vehicles (EVs) in India.
- The web portal will be accessible through different devices such as PCs, mobile phones, tablets, screen readers. NITI Aayog is working on adding more features and innovative tools to make the e-AMRIT portal more interactive and user-friendly.

Features of e-amrit

- The e-AMRIT portal by offering access to information about electric vehicles aims to assist electric vehicle users about various services.

- Feasibility research on switching to EV: Switch to electric vehicles by offering insights about electric vehicle technologies, types of electric vehicles, insurance options, and financing options.
- Knowledge repository on EV: Set up the electric vehicle or associated enterprise by providing insights on the key initiatives of central and state governments.
- Tools to calculate EV experience: Assess the benefits of electric vehicles with uniquely designed tools to determine the users' savings with electric vehicles compared to petrol/diesel vehicles.
- Information about EV businesses: Get all the information on the Indian electric vehicle market and industry and the key developments driving the e-mobility ecosystem forward.

Significance of e-amrit

- In the recent past, India has taken many initiatives to accelerate the decarbonisation of transport and adoption of electric mobility in the country.
- Schemes such as FAME and PLI are especially important in creating an ecosystem for the early adoption of EVs.
- NITI Aayog intends to add more features and introduce innovative tools to make the portal more interactive and user-friendly.
- The e-AMRIT portal will accelerate initiatives of the government to raise awareness on electric vehicles. It will sensitize people on benefits of adopting electric vehicles. It act as an accelerator of change and influence millions of users.
- Myths lead to slower adoption of electric vehicles. Portal is an attempt to create awareness about the benefits of EVs, share information about the various types of EVs available in India, bust the myths surrounding their use, and also to share details of financing options, thereby helping the move towards a cleaner, greener, economical option.
- Portal intends to complement initiatives of the government on raising awareness about EVs.
- It aims to sensitize consumers on the benefits of switching to electric vehicles.
- NITI Aayog intends to add more features and introduce innovative tools to make the portal more interactive and user-friendly.

Conclusion

Electric vehicles can convert about 59%–62% of the electrical energy from the grid to power at the wheels. Conventional petrol vehicles can only convert almost 17%–21% of the energy stored in petrol to power at the wheels. Even CNG engines are not entirely clean as they emit ammonia and produce particulate emissions. There is need for faster adoption of electric vehicles and for that, awareness among masses is

most important. E-Amrit initiative is a step in that direction for being a one-stop destination of electric mobility.

6. Geopolitics and energy crisis are closely intertwined. Do you agree? Illustrate in the context of India's dependence on imports to meet its energy needs.

Approach

Candidate can start the answer how geopolitics and energy crisis are interlinked also write about Indian dependency on imports for its energy requirements illustrate several threats and consequences such as rare earth elements from the China, in the end try to give wayforward to reduce such dependency on imports.

Introduction

However, the global energy system is undergoing a transition away from nearly complete dependence on fossil fuels toward a greater reliance on clean and renewable energy sources. It impacts the geopolitics of energy; India's energy diplomacy should not be just about cheaper oil but a long-term commitment to clean environment.

Body

India's dependency:

- India is the world's third-largest oil consumer at around 5 million barrels a day, behind the US and China. The oil demand is growing at 3-4% a year in the country.
- As per Petroleum Planning and Analysis Cell (PPAC), India's oil import dependence based on consumption was 85% in 2019-20, which declined marginally to 84.4% in 2020-21 rose again to 85.6% in 2021-22. For April 2022-23, the oil import dependence was around 86.4% against 85.9% in the corresponding year-ago period.

Energy crisis and its geopolitical consequences with Indian context:

- Impacts foreign policy decisions: India's overreliance on oil exporting countries provides leverage to major powers for diplomatic bargaining with India.
- For example, India had to succumb to the USA's sanctions to discontinue its import of cheap Iranian oil. Similarly, Pakistan's strategic location creates significant hindrances to TAPI gas pipeline.

- Securing sea lines: India had to constantly keep vigil on global threats like piracy, terrorism, oil spills, etc to secure its sea lines of communication particularly in the Arabian Sea.
- Challenge from Oil Producing Countries: The global energy requirements represents a challenge for oil and gas importing countries like India and in particular for those with a less diversified economy more dependent on oil.
- For example, since the second half of the 20th century, control of oil resources has played a central role in several wars, such as the Iran-Iraq War (1980-1988), the Gulf War (1990-1991), also recent drone attacks on the oil exploration site of Saudi Arabia and impacts due to Ukraine crisis on supply chain of oil.
- Global Warming & Global Concern: The global concern for more than half a century coal, oil and natural gas have been at the heart of the geopolitics of energy. For example, recent phase down and phase out debate had pressurized Indian coal imports. However, the over-dependence on coal has brought the global issue of global warming into the forefront.
- Many important events like the Kyoto Protocol signing & Paris Agreement marked the critical steps forward in global efforts to respond to the challenge of global warming.
- Supply of Rare-Earth Mineral: The rapid development of wind and solar energy, together with that of electric cars, raises concerns about the security of supply of the minerals needed to manufacture them. The dominance of China in the supply of these rare minerals and current geopolitical tension between US & China could trigger a case like the 'cobalt crises of 1978.
- Threats Emanating from Energy Integration: The spread of renewable energies will increase electrification and stimulate cross-border trade in electricity. For example, OSOWOG. The digitisation of electricity grids will require to import massive digital products.
- It presents security risks especially cyber threat for example zero-day attack, as terrorist groups or hostile, rogue countries could seek to either enter the systems to extrapolate information, or to disrupt them to cause economic and social damages.

Wayforward to attain self-sufficiency:

- Raising domestic production: HELP policy would boost the exploration, licensing and production of fossil fuel-based hydrocarbons. Expanding production in existing oil and gas fields of K-G basin, Cambay basin and Indian Ocean while simultaneously exploiting potential sites in North Eastern Region (Arunachal Pradesh), etc.
- Renewable energy: Renewable energy sources like solar, wind, hydropower, etc are the most suitable options to eliminate import dependence. India has set a target of generating 175GW of renewable energy (100GW by solar + 60GW wind) by 2022.
- Alternative sources: Domestic production of alternative sources of energy like biofuels (bioethanol, bio-CNG,etc) should be increased. The National Policy

on Biofuels 2018 suggests providing viability gap funding scheme for 2G ethanol Bio refineries, which is a step in the right direction.

- Diversifying imports: India should look beyond middle-eastern countries or OPEC members for oil imports. Newer emerging alternatives like US' shale gas production, opportunities in Russia's far eastern region should be exploited.
- Strategic Petroleum Reserves: Building petroleum reserves like underground tank storage is needed to manage any disruption in oil demand and supply. India should expand its SPR network from already existing storage networks at Mangalore, Visakhapatnam and Padur.

7. Comment on the status of India's urban mobility infrastructure.

Approach

Question is straight forward. Candidate can explain the status of India's urban mobility in detail followed by the way forward to improve the situation. A detailed suggestions can be laid out in answer.

Introduction

Urbanization is supposed to bring modernity and prosperity. The Western example showed how a mass movement off the farm and into cities went together with great leaps in productivity. But the Indian cities are characterized by increasing levels of congestion, pollution, road accidents and inequality in access to mobility. The need for better urban mobility in order to build inclusive, safer and more sustainable cities cannot be underestimated.

Body

Status of India's urban mobility

- Unprecedented Transport Growth: According to Niti Aayog, the number of registered motor vehicles has increased from 5.4 million in 1981, to 210 million in 2015. This rapid growth in demand in the absence of widespread public transport system has caused a rapid increase of private car ownership in India.
- Inadequate Public Transport: According to government data, there are about 19 lakh buses in the country and only 2.8 lakh of them are run either by state transport undertaking or under stage carriage permits.
- China has about six buses for 1,000 people while India has only four buses per 10,000 people
- Further, a CSE study points out that the share of public transport is expected to decrease from 75.5% in 2000-01, to 44.7 per cent in 2030-31, while the share of personal transport will be more than 50%.

- Weak Regulations by umbrella authorities: State governments, which retain effective control over urban development rather than city administrations, have failed to operationalise the umbrella authorities to regulate transport.
- Vehicular Exhaust causing Pollution: As per a WHO study, 14 out of top-15 most-polluted cities in the world are in India. Rising pollution levels also translate into economic losses. As per current estimates the World Bank, the losses amount to 7.7% of the nation's GDP.
- Traffic Congestion: Vehicles in some metros move at an average speed of 17kph. The congestion on the roads doesn't exist in silos, and its adverse effects are carried forward to productivity and economic growth. As per the BCG-Uber report, the combined estimate of losses caused due to congestion in the top-four metro cities of India is worth more than $22 billion per annum.
- Multi-purpose use of roads in business zones: Roads in cities are multi-purpose public goods, used by various classes of motorized and non-motorized vehicles to travel, park, street-selling etc. Non-transportation uses of the roadway do slow down motorized vehicles.
- Innovative Products still at nascent stage: Common mobility cards that would help citizens use bus, train and feeder networks seamlessly were largely in pilot project mode even before the pandemic
- Expensive Mass Transport: There is valid criticism that the existing paradigm is one of "exclusionary urbanisation", which makes Metro and bus services expensive for the majority, particularly for those forced to live in the suburbs due to housing costs, and sometimes making the per kilometre cost of using a two-wheeler more attractive.
- Poor Recognition of Urban areas: Census 2011 showed that the number of Census Towns, which are urban for census purposes but not named urban local bodies, grew tremendously over a decade. They lack access to funding, infrastructure and capacity to meet the needs of large populations even now.

What can be done?

- NITI Aayog Recommendations: It calls for a 3C Framework (Clean, Convenient and Congestion free) for transforming mobility in India. To achieve this, it lays down the action-agenda
- Niti Aayog calls for a Safe, Adequate and Holistic Infrastructure (SAHI) for the Indian population including women, elderly and the disabled. Major recommendations for achieving this:
- Increased emphasis on safety and accessibility
- Leveraging multiple modes of transport– road, rail, coastal and inland waterways, small regional airports, ropeways etc.
- Higher usage of data for holistic mobility needs
- Optimize Travel footprint: It calls for increased emphasis to reduce congestion caused by passenger and goods flow in urban areas. Major recommendations include:

- Integrated land use- Planning residential and commercial complexes in an integrated manner so that travel time is reduced
- Focused policy based measures for optimizing travel
- Data-based measures such as intelligent transport systems
- Promote Seamless Public Transport: It calls for an efficient and convenient public transport to address the issue of air pollution and congestion in Indian cities. Major recommendations include:
- Data-driven planning and urban transport, with a clear hierarchy amongst different modes- from non-motorized (pedestrians, cycles) to public and lastly private transport.
- Focus on multi-modal systems
- Make public transport affordable, comfortable and accessible for urban India, to ensure better adoption
- Adopting Green Modes and Technologies: It calls for rapid adoption of electric vehicles and non-motorized transport (NMT). Major recommendations include:
- To improve adoption of non-motorized transport, the routes and paths should be planned so that they integrate seamlessly with public transport.
- To ensure safety for NMT users by outlining norms & dedicated traffic signals should be a key priority.
- There should be a clear push towards clean technologies. This has to be enabled through ecosystem development which includes domestic manufacturing, deployment of charging infrastructure etc.

Conclusion

Centre is required to work with State governments to integrate key areas with its transport vision, such as affordable inner-city housing, including rental projects, access to civic services and health care, and enhanced sustainability, greenery and walkability. More local approach can be taken to make mobility more affordable and accessible.

8 Public infrastructure expansion without private investment isn't a viable proposition .do you agree? substantiate your views .

Approach

A simple straightforward question where candidates need to write about importance of private investment in public infrastructure as such large projects cant be funded by government alone, In second part of answer candidates should write about their views on it and substantiate it.

Introduction

For an emerging economy like India, with more than a billion people, infrastructure, which provides essential services, also reflects reliability, assurance, low-cost

production, and market competitiveness. Public investment in the nation's infrastructure has been insufficient to develop the foundation for long-term growth. Hence private investment in large infrastructure projects is need of hour .

Body

India will unveil a series of infrastructure projects as a part of a plan to invest 100 trillion rupees (US$1.39 trillion) in the sector over the next five years, in a push to improve the country's ailing economy.

- Such an enormous level of investments can't be afforded by the government alone and thus necessitates partnerships with various stakeholders in the private sector.
- Furthermore, infrastructure can provide social and economic advantages only when the capital and operating costs can be financed sustainably, either by the revenues a project generates or by the government sponsor.
- Too many projects become an economic burden and drain on finances when a government borrows money for an undertaking and neither its revenues nor its direct and indirect economic benefits adequately cover the cost.
- Considering that infrastructure development require huge upfront investments, the Government has embarked on a policy of promoting Public Private Partnership (PPP) as a means of augmenting investment in infrastructure.
- Presently, the Indian economy is facing an acute economic crisis, triggered Covid-19 pandemic. The National Statistical Office has estimated that the economy would shrink by 7.7%. Against this background, Budget 2021 has provided a reasonable stimulus to infrastructure growth.
- However, apart from concerns emanating from the rising fiscal deficit, infrastructure development in India has its own issues. Thus, if the Indian economy wants to reap intended benefits and minimize risks of contemplated fiscal stimulus, there is a need to carry out reforms that impede the development of Infrastructure.

Why government need private investment in infrastructural projects -

Issues Related To Infrastructure Development
- **Revenue Shortfall**: Slippage in revenue estimates may not be ruled out on account of the realization of lower than anticipated increases in nominal GDP growth, direct tax buoyancy, and disinvestment targets.
- **Lesser Funds With States:** The Union government has accepted the 15th Finance Commission report recommendation, according to which vertical share of tax devolution from the center to states has been reduced 42% to 41%.
- Moreover, the central government increasingly resort to the imposition of cess which are almost permanent have reduced the shareable pool.

Issues Associated With Burgeoning Fiscal Deficit:
- Infrastructure development in India will be funded by fiscal stimulus.

- This can be reflected as the Centre has indicated taking the fiscal deficit to 4.5% of GDP by 2025-26.
- However, the rising fiscal deficit can cause macro-economic stability issues like high inflation, crowding out, a downgrade of international ratings, etc.

Issues Associated With Bad Bank:

- Finding buyers for bad assets in a pandemic hit economy will be a challenge, especially when governments are facing the issue of containing the fiscal deficit.
- Also, the bad bank idea is like shifting loans from one government pocket (the public sector banks) to another (the bad bank).

Structural Problems:

- Due to land acquisition delays and litigation issues, the rate of implementation of projects is very slow on global standards.
- Further, getting approvals are very difficult in terms of land access, environmental clearances, impending litigation in court delays the infrastructure projects
- Cabinet Committee on Economic Affairs has approved continuation and revamping of the Viability Gap Funding (VGF) Scheme under the Public Private Partnership (PPP) model till 2024-25 with a total outlay of Rs. 8,100 crore.
- Viability Gap Funding (VGF) means a grant one-time or deferred, provided to support infrastructure projects that are economically justified but fall short of financial viability.
- Public-Private Partnerships (PPPs) involve collaboration between a government agency and a private-sector company that can be used to finance, build, and operate projects, such as public transportation networks, parks, and convention centers.
- The Viability Gap Funding (VGF) provided for economic infrastructure will be extended to social infrastructure.
- The scheme will promote PPPs in social and economic infrastructure leading to efficient creation of assets and ensuring their proper operation and maintenance and make the economically/socially essential projects commercially viable.
- Economic Infrastructure refers to the elements of economic change that aid in the process of production and distribution such as energy, transportation, communication, banking and financial institutions etc.
- Social Infrastructure refers to all those facilities and institutions that enhance the quality of human capital such as educational institutions, hospitals, nursing homes, housing facilities etc.
- Revamping of the VGF Scheme will attract more PPP projects and facilitate private investment in the social sectors.
- Creation of new hospitals, schools will create many opportunities to boost employment generation.
- The Scheme will encourage private investment in infrastructure on the lines suggested by the Kelkar Committee.

Conclusion -

A roadmap to implement infrastructure projects with the PPP model will be sustainable and it will reduce the burden on the government's financial capacity. Although the private sector is a profit based sector, if regulated in a suitable way, it would be beneficial for the government, the private sector as well as the nation. If India is aiming at world class infrastructure, there are several things that need increased attention and encouragement such as the industry-academia partnership to fillip the R&D sector.

9. The coastal geography of India makes it an ideal candidate to become a global hub for trade and commerce. Yet, Indian port infrastructure is used for a relatively small percentage of global trade movements. Why? Analyse. To remedy this, what measures are needed? Discuss.

Approach

Candidate can start with basic information on Indian coastal potential and then simply explain what is ports and low global trade and commerce of Indian ports with different reasons and factors. Also try to give remedies to globalize the Indian ports for cargo traffic.

Introduction

India is strategically located on the world's shipping routes with a coastline of approximately 7,517 km. Maritime transport handles around 80% of India's trading in value terms. To promote India's shipping and port industry for trade and commerce, the government has introduced various measures to professionalise port governance by setting up boards, enterprises that develop, maintain and operate ports, coastal waterways.

Body

Ports:

- A port can be defined as a harbor or an area that is able to provide shelter to numerous boats and vessels (transferring people or cargo) and can also allow constant or periodic transactions of shipment.

Global trade and commerce of Indian ports:

- Despite its long coastline and strategic location on world trade routes, which gives it a natural advantage to control and direct shipments, India has not managed to get a dominant grip on shipping, even in its own continent.

- The World Bank Logistics Index released in ranked India 35th, far behind the US at 14 and China at 26.
- Cargo handled at major ports is bulk (44% – iron ore, coal, and fertilizer), liquid (33% petrol, oil, and lubricants), and container (23%).
- The key international ports handling Indian transhipped containers are Colombo, Singapore and Klang in Malaysia.

Issues faced by various Indian ports to gloabalize it base and cargo traffic:

- **High turnaround times:** Ports in India suffer from high turnaround times for ships. For example, in Singapore, average ship turnaround time is less than a day. However, in India, it is over 3 days.
- **Manpower and Labor Issues:** Lack of adequate training, falling manpower quality, opposition to reform are major issues
- **Unhealthy Competition:** Analysts have cited the concerns over development of multiple ports in close vicinity handling similar cargo as it might lead to ports competing for the same cargo arrivals.
- **Sub-optimal Transport Modal Mix:** Lack of requisite infrastructure for evacuation from major and non-major ports leads to sub-optimal transport modal mix.
- **Lengthy inspection and scrutiny:** Though customs operations in India are rapidly going paperless and converting to digital, inspections and scrutiny continue to be lengthy for cargo and other shipping operations. Indian shipping industry is subjected to some 12 types of taxes. This increases the cost.
- **Port congestion:** Port congestion due to container volume, shortage of handling equipment and inefficient operations is a major concern. Eg. Nhava Sheva port, Congestion at the approach roads is a common problem observed at the Jawaharlal Nehru Port in Maharashtra.
- **Inadequate infrastructure and Technology Issues:** Lack of adequate berthing facility, number of births, and sufficient length for proper berthing of the vessels at the Non-Major Ports. Most Non-Major Ports do not have proper material handling equipment in place which could facilitate a quick turnaround. Lack of equipment for handling large volume and lack adequate navigational aids, facilities and IT systems.
- **Role of international ports-** The east coast also loses trans shipped container cargo to international ports. Colombo benefits majorly from India's loss, taking 27-31 % and most of the east coast ports, such as Kolkata, Haldia, Vizag and VO Chidambaranar, are losing mainline/direct traffic to Colombo.
- **No trans-shipment hub-** The loss is primarily because India does not have a trans-shipment hub of its own around the southern tip.
- **Unavailability of vessels-** There is an unavailability of mainline vessel calling at these ports.
- **Corporate level management:** Unfortunately, freight management and freight forecasting are undertaken in a very rudimentary manner in India.

Most organizations treat freight procurement as a part of 'supply chain' or 'logistics' issue, leading to high freight costs.

- Underutilisation of physical infrastructure in particular though is extremely prevalent at another private terminal — the Vallarpadam International Container Transhipment Terminal — at the Cochin Port.
- Haldia Port, West Bengal, being a riverine port, faces the natural challenge of heavy siltation and inadequate dredging capacities.
- In Paradip Port, Odisha, there is issue of semi-mechanisation and manual handling of critical processes having a cascading effect on overall operational efficiency. It highlights the importance of complete mechanisation of processes to ensure seamless operations and thereby lower down vessel turnaround time.

Remedies:

- Environmental clearances, Tariff norms, land acquisition etc. need to be standardized and implemented for the port sector so as to boost foreign investments.
- Priority should be given on expanding capacity and improving operational efficiency. Emphasis should be placed on installing advanced cargo handling processes, scalability in processes and mechanization of port operations Singapore model to be applied.
- Technologies like big data and advanced GPS navigation systems should be optimally used for better functioning of ports
- The regulatory regime should be made less complex and less rigid. Further, there should be vertical integration of all stakeholders for holistic development of ports in India
- Port modernization and new port development, port connectivity enhancement, port-linked industrialization and coastal community development under the Sagarmala project has an immense scope for reduction in transportation and logistics costs and boosting export competitiveness.
- The government needs to open up the dredging market to attract more players, particularly international players, in dredging activities to increase and maintain draft depth at ports to attract large vessels and enable them to become hub ports.

Conclusion

Recognising the important role port-led development can play in India, the Central government must undertake several initiatives such as development of new ports, modernisation and mechanisation of the existing ones, and reduction of logistics costs through the implementation of increased waterways transport must be carried out.

10. In terms of border infrastructure expansion in India, what recent developments have taken place? What is its significance? Analyse.

Approach

Candidate can give a brief picture of significance of border infrastructure in the beginning followed by the recent developments in border infrastructure. Various initiatives can be stated in detail.

Introduction

India with 17 bordering states share the international borders with Pakistan, China, Nepal, Bhutan, Myanmar and Bangladesh. All of this border, comprised of unique topography, culture and varied socio-economic challenges. Considering unity of the nation and neighbourhood first policy of India, it is imperative to develop modern and competitive border road infrastructure.

Body

Significance of border infrastructure

- Proper border road infra will reduce trafficking and smuggling, which is currently a big cause concern for India and neighbouring countries. One of the most important advantages is development of legal and amicable trade relations with neighbouring countries.
- Another major economic benefit is inclusive growth and development. Border road infrastructure, especially in harsh terrains such as northeast and Jammu & Kashmir provides avenue for self-employment and boost to traditional small scale Industries.
- One of the major advantages is that through border infra India will be successful in pushing for her ambitious neighbourhood first and act east policies. It will act as soft power in terms of creating people to people contacts. Best example of this is the most recent project of Kartarpur Corridor.
- Another important advantage of border roads is in proper and swift disaster management. Difficult and harsh terrains of Indian borders and relatively low development of bordering countries make it inevitable for India to prepared and self-sufficient to handle any kind of disasters.

Recent developments

- "Border Infrastructure and Management" (BIM) is a central sector scheme and it has been continued over the 15th Finance Commission cycle from 2021-22 to 2025-26.
- The scheme will strengthen the border infrastructure for improving border management, policing and guarding the borders.

- The BIM scheme will help in the creation of infrastructure such as construction of border fence, border flood lights, technological solutions, border roads and Border Outposts (BOPs)/Company Operating Bases (COBs) to secure the Indo-Pakistan, Indo-Bangladesh, Indo-China, Indo-Nepal, Indo-Bhutan and Indo-Myanmar borders.
- The infrastructure on the Indo-China border is undergoing a major upgrade, more so in the aftermath of the border row that led to skirmishes with the Chinese troops in Galwan in 2020.
- 18 border roads are already complete and operational, 7 are about to be completed and work on 8 roads under Phase 11 of the Indo-China Border Roads project.
- Under the vibrant village initiative under the border area development programme, development will be pushed in the border villages by building roads, mobile towers, banks etc.

Smart Fencing in India (CIBMS):

- Two pilot projects covering about 71 Kms on Indo-Pakistan Border (10 Kms) and Indo-Bangladesh Border (61 Kms) of Comprehensive Integrated Border Management System (CIBMS) have been completed.
- CIBMS involves deployment of a range of state-of-the-art surveillance technologies — thermal imagers, infra-red and laser-based intruder alarms, aerostats for aerial surveillance, unattended ground sensors that can help detect intrusion bids, radars, sonar systems to secure riverine borders, fibre-optic sensors and a command and control system that shall receive data from all surveillance devices in real time.
- BOLD-QIT (Border Electronically Dominated QRT Interception Technique) under CIBMS on the Indo- Bangladesh border in Dhubri district of Assam is also being used.

The Border Area Development Programme:

- BADP was initiated in the border areas of the western region during the Seventh Five Year Plan (1985-90), for ensuring balanced development of border areas through development of infrastructure and promotion of a sense of security among the border population.
- The programme aims to meet the special development needs of the people living in remote and inaccessible areas situated near the international border and to saturate the border areas with the essential infrastructure through convergence of Central/State/BADP/Local schemes and participatory approach.
- The Border Area Development Programme (BADP) has been allocated Rs. 784 crore for projects in areas of States/UTs inhabited along the Indo-China border i.e. Arunachal Pradesh, Himachal Pradesh, Ladakh, Sikkim and Uttarakhand.

- BRO- has constructed lifelines of over 53,600 km for the people of Sikkim, Arunachal Pradesh, Mizoram, Manipur, Nagaland, Tripura, Meghalaya, Ladakh, Jammu & Kashmir, Uttarakhand, Himachal Pradesh and Andaman & Nicobar Islands.
- India is continuing the infrastructure for better connectivity to the Line of Actual Control with China. E.g. the construction of a strategic tunnel in Uttarakhand as a part of the Char Dham Pariyojana.

Conclusion

In the light of the recent incident of face-off between India and China the creation of infrastructure is a strategic move for the better management of the border areas. There is also a need of strengthening the Border Road Organisations (BRO) so that projects can run without any hurdle. Effective and efficient border management will ensure timely management of conflict in the future.

11. What is 'Synthetic Biology'? What is its significance? What are the concerns around its applications? Discuss.

Approach

Candidate can start the answer with recent reference to the draft paper on synthetic biology and then with explaining what is synthetic biology explain its importance in different field its significance also highlight the concerns around its applications.

Introduction
Recently draft foresight paper on synthetic biology released by the Department of Biotechnology. It also attempts to define synthetic biology and how intellectual property rights will be applicable to resulting processes and products. Draft will later help in creating a national policy.

Body

Synthetic Biology

- The term 'synthetic biology' was first used by Barbara Hobomin in 1980, to describe bacteria that had been genetically engineered using recombinant DNA technology.
- Synthetic biology was initially synonymous with 'bioengineering'.
- In 2000, the term 'synthetic biology' was again introduced by Eric Kool and other speakers at the annual meeting of the American Chemical Society in San Francisco.

- Synthetic biology refers to the science of using genetic sequencing, editing, and modification to create unnatural organisms or organic molecules that can function in living systems.
- Synthetic biology enables scientists to design and synthesise new sequences of DNA from scratch.

Synthetic biology has multifarious applications of energy, agriculture and biofuels. Thus, there is always a perceived threat of components releasing into the open environment. Significance of synthetic biology:

- Standardised Biological Parts: identify and categorise standardised genomic parts that can be used (and synthesised quickly) to build new biological systems.
- Applied Protein Design: redesign existing biological parts and expand the set of natural protein functions for new processes. For example, Modified rice to produce beta-carotene (a nutrient usually associated with carrots), that prevents Vitamin A deficiency.
- Natural Product Synthesis: engineer microbes to produce all of the necessary enzymes and biological functions to perform complex multistep production of natural products. For example, Microorganisms harnessed for bioremediation (use of living microorganisms to degrade environmental contaminants into less toxic forms) to clean pollutants from water, soil and air.
- Synthetic Genomics: design and construct a 'simple' genome for a natural bacterium. For example, Yeast engineered to produce rose oil as an eco-friendly and sustainable substitute for real roses that perfumers use to make luxury scents.
- Synthetic biology has applications in various fields from developing synthetic organisms for vaccination to creating natural products in a lab such as vanillin, the organic compound extracted from vanilla seeds, which can now be grown in yeasts with additional plant genomes.
- In the pharmaceutical industry, synthetic biology can be used to make natural compounds such as artemisinin used for the treatment of malaria and Car T cell therapy for cancer treatment.
- It is starting to be used in the fashion industry as well; some companies are exploring the possibility of dyeing jeans without producing hazardous waste.
- Then there are companies using it to deliver fixed nitrogen to plants instead of using fertilisers, engineering microbes to create food additives or brewing proteins.
- Other applications to therapeutics include engineered networks and organisms for disease-mechanism elucidation, drug-target identification, drug-discovery platforms, therapeutic treatment, therapeutic delivery, and drug production and access.

Challenges and concerns:

- The great challenge of synthetic biology is that the biological systems are complex, and the operating principles are still not fully elucidated.
- The intentional or accidental release of genetically engineered organisms into the environment could have significant negative impacts on both human and environmental health.
- Misuse of these technologies and a failure to account for unintended consequences could cause irreversible environmental damage.
- Regulating the use of easily accessible and low-cost technologies like CRISPR will likely be a challenge for authorities.
- There is also growing concern that the technology could be misused by extremist groups.
- A unique ethical concern about synthetic biology is that it may result in the creation of entities that fall somewhere between living things and machines.
- It is not difficult to see why some products of synthetic biology might fail to fit comfortably into our intuitive dichotomy between the living and the non-living.

Conclusion

Under the precautionary principle, stringent risk assessment and the inclusion of diverse stakeholder perspectives should be applied in the development and handling of innovative synthetic biology applications and products. It is time for India to consolidate its stand on the science of synthetic biology and communicate its interests and aspirations in relevant international fora with clarity and should avoid conflicting stands on science on one hand and policy on the other.

12. What do you understand by 'Edge Computing'? Discuss its advantages?

Approach

A straight forward and technical question. Candidate can define edge computing in detail. The need of edge computing can be highlighted followed by the advantages and disadvantages of the same.

Introduction

Edge computing is a networking paradigm that focuses on placing processing as close as feasible to the source of data to reduce latency and bandwidth usage. In simple words, Edge computing is a distributed IT architecture that brings computing resources from clouds and data centers as near to the source as possible. Its major purpose is to reduce latency while processing data and lowering network expenses.

Body

Why Edge computing

- In traditional computing methods, the data is first displayed on the screen of a user and is then sent to the server using the internet, intranet, LAN e.t.c. Here, at the server, the data is stored and processed.
- But, as this data kept on increasing with the growth of the internet and so did the devices connected to the internet, these data storage infrastructures started seeming incapable of storing that much data.
- According to a Gartner study, by 2025, 75% of company data would be generated outside of centralized data centers. This volume of data places tremendous pressure on the internet, causing congestion and interruption.
- To tackle this, the concept of "Edge Computing" was introduced.
- The idea behind edge computing is straightforward: rather than bringing data closer to the data center, the data center is moved closer to the data. The data center's storage and processing resources are installed as close as possible to where the data is generated (preferably in the same place).

Advantages of edge computing

- Response Time and Latency
- A company's every millisecond is critical to its success. Downtime or latency might cost them thousands of dollars. Edge computing can reduce latency and hence boost network speed. In addition, processing data closer to the source of information, considerably lowers the distance it must travel.
- The ultimate result is a latency measured in microseconds rather than milliseconds. As a result, the overall service's speed, quality, and responsiveness have improved.
- High Security and Less Risk
- The data stored in the cloud has a high risk of being hacked. This can be avoided since edge computing only sends the appropriate data to the cloud. In addition, edge computing does not always necessitate the use of a network connection. Therefore, even if hackers gain access to the cloud, not all users' information is at risk.
- However, this does not guarantee that edge computing is risk-free. Nevertheless, when compared to the cloud, this provides a possibly reduced risk profile.
- Lesser Transmission Costs
- In addition to the possibility of simplifying cloud security approaches, edge computing can also result in significant cost reductions due to lower bandwidth. Because so much data is now processed and stored in localized servers and devices, there is no need for most data to go to data centers. As a result, edge computing requires less bandwidth at the data center level.
- Data centers can save bandwidth capacity and prevent costly improvements to existing cloud storage features by storing fewer data in the cloud and processing more locally.
- Scalability and Versatility

- Data must be transmitted to a centralized data center in a cloud computing system. Modifying or expanding this data center can be pricey at times. On the other hand, the edge may be utilized to scale your own IoT network without having to worry about storage. Furthermore, IoT devices can be placed here with just one implantation.

Disadvantages of edge computing

- Security
- Although edge computing improves security by reducing the quantity of data that has to be protected in data centers, it also raises security concerns at each localized point of the edge network. In addition, some data is more vulnerable to breaches because not every edge device has the same built-in authentication and security capabilities.
- Infrastructure costs
- Networking technology is always a huge investment, whether you invest in large multinational clouds or scattered edge devices for your computing needs. While investing in a more robust edge network saves money on data center bandwidth, the strategy comes with its own set of costs to launch and manage edge devices.
- Edge devices may require more hardware and software for optimal performance and local storage needs, and costs can quickly escalate when they're spread across multiple local geographies.
- Data Loss
- It can be tedious to sift through all of the data in a cloud data center, but the data's central storage gives you the peace of mind that it will be there when you need it. While edge computing processes save space and money for storage, critical data could be misconstrued and destroyed by an edge device by accident.

Conclusion

When the computing process is carried out in remote locations, edge computing works better due to little to no connectivity to enable a centralized approach. It will help with local storage, working as a micro data center. Edge computing is a better solution for supporting smart and specialized devices that perform special functions and are different from regular devices.

13 Do you think it is important to adopt a global ethical standard or code for the application of AI ? substantiate your views .

Approach

In this question candidates need to write about what is artificial intelligence and how applications of artificial intelligence need to be controlled ,in second part of answer

write about how how global ethical standard code is need of hour as AI is the future of world .

Introduction

Artificial intelligence leverages computers and machines to mimic the problem-solving and decision-making capabilities of the human mind. From predicting what we want to see as we scroll through social media to helping us understand weather patterns to manage agriculture, AI is ubiquitous, with the rise in the market for AI, there arises a need to have global regulations and agreements on Ethics of Artificial Intelligence to ensure that AI is developed with common, humanistic values at its core..

Body

In November 2021, 193 countries reached a groundbreaking agreement at UNESCO on "Ethics of Artificial Intelligence". It sets the first global normative framework while giving States the responsibility to apply it at their level.The agreement aims at how AI should be designed and used by the governments and the tech companies.

Objectives of the Agreement

To Maintain Balance of Power-
- It aims to fundamentally shift the balance of power between people, and the businesses and governments developing AI.
- If human interest are not given priority in how these technologies are developed, inequalities will grow to a magnitude never before experienced in history

Regulate Life Cycle-
- UNESCO's member countries have agreed to implement this recommendation by enacting actions to regulate the entire AI system life cycle: 'Research-Design-Development-Deployment and Use'
- It means they must use affirmative action to make sure that women and minority groups are fairly represented on AI design teams.

Management of Data, Privacy and Access to Information-
- It establishes the need to keep control over data in the hands of users, allowing them to access and delete information as needed.
- It calls on member states to ensure that appropriate safeguards schemes are devised for the processing of sensitive data and effective accountability, and redress mechanisms are provided in the event of harm.

Banning Social Scoring and Mass Surveillance-
- It explicitly bans the use of AI systems for social scoring and mass surveillance.
- It stresses that when developing regulatory frameworks, Member States should consider that ultimate responsibility and accountability must always lie with humans and that AI technologies should not be given legal personality themselves.

Protecting the Environment-
- It emphasises that AI actors should favour data, energy and resource-efficient AI methods which are more prominent in the fight against climate change and on tackling environmental issues.
- It asks governments to assess the impacts such as carbon footprint, energy consumption and the environmental impact of raw material extraction for supporting the manufacturing of AI technologies.

What are the Issues identified in Artificial Intelligence?
- **Incomplete Presentation of Data-**
- The data used to feed into AI often aren't representative of the diversity of societies, producing outcomes that can be said to be biased or discriminatory.
- For instance, while India and China together constitute approximately a third of the world's population, Google Brain estimated that they form just 3% of images used in ImageNet, a widely used dataset.

Technological Challenges-
- facial recognition technologies, which are used to access our phones, bank accounts and apartments, and are increasingly employed by law enforcement authorities, in identifying women and darker skinned people
- For three such programs released by major technology companies, the error rate was 1% for light skinned men, but 19% for dark skinned men, and up to 35% for dark skinned women. Biases in facial recognition technologies have led to wrongful arrests.

Promoting Prejudices and Inequalities-
- It shouldn't be forgotten that AI systems are created by humans, who can be biased and judgemental. Thus, AI can promote prejudices and inequalities, if initial training of the AI algorithms are biased.
- For example, it can lead to AI facial recognition and surveillance technology to discriminate against people of color and minorities.

Compromising Privacy-
- AI systems learn by analyzing huge volumes of data and they keep adapting through continuous modelling of interaction data and user-feedback.
- Thus, with the increasing use of AI, the right to privacy can be under threat due to unauthorized access to one's activity data.

Disproportionate Power and Control-
- Technology giants are investing heavily in regard to artificial intelligence, both at the scientific/engineering and also at the commercial and product development level.
- These big players have an unmatched advantage when compared to any ambitious competitor out there which is a symptom of data-oligarchic society.

What Initiatives have been Taken to Promote Ethical AI?

National Initiatives-
- Global Partnership on Artificial Intelligence (GPAI):
- In 2020, India joined the GPAI as a founding member to support the responsible and human-centric development and use of AI.

RAISE 2020-
- RAISE (Responsible AI for Social Empowerment) 2020 is a first of its kind, global meeting of minds on Artificial Intelligence to drive India's vision and roadmap for social transformation, inclusion and empowerment through responsible AI.

Way Forward

International Cooperation-
- Given that various governments have only recently established AI policies, and in some cases are still formulating them, international cooperation is still very much a work in progress. in the setting of standards at the multilateral level.

Right Steps Taken-
- AI technological revolution brings great opportunities for prosperity and growth — but it has to be ensured that the technology will be applied and used in the right direction.

Conclusion

AI related technologies cannot continue to operate without a common rulebook. Over the coming months and years, the UNESCO Agreement's recommendation will serve as a compass to guide governments and companies, to voluntarily develop and deploy AI technologies that conform with the commonly agreed principles.as AI is future a robust legal framework will be needed to deal with those issues too complex to be addressed adequately by legislation. But the political and legal process alone will not be enough. For trust to flourish, an ethical code will be equally important.

14. Explain the significance of Nambi Narayanan's contributions to space technology.

Approach

Candidate can start with basic information scientist alleged spying case and then simply highlight his contribution to Indian space technology with giving specific context.

Introduction

While working at ISRO, Narayanan was accused of selling vital secrets associated with Indian space technology to Pakistan. Though he was later acquitted by a CBI court and the Supreme Court in 1998, he spent a total of 50 days in jail along with other fellow. He was compensated with 50 lakh by the Supreme Court for "unnecessary arrest, harassment and mental cruelty" in the infamous 1994 espionage case.

Body

- At the time of his arrest on November 30, 1994, Mr. Narayanan was working on cryogenic engine technology at the premier Indian Space Research Organisation (ISRO).
- The police investigators had accused him of passing on documents and drawings of ISRO relating to Viking/Vikas engine technology, cryogenic engine technology and PSLV flight data/drawings to Pakistan.

Important contribution of Nambi Narayan to space technology:

- Nambi Narayanan now regarded as the Father of Liquid Propulsion engine technology in India, who impressed upon the organization to consider diverting resources to urgently develop liquid fuelled engines, given how they were the future of rocketry and how advanced nations were achieving more with these engines.
- After Nambi Narayanan completed his course in record-time, when the Americans tried to poach Nambi, by coaxing and showing him the high-end American facilities, it was Sarabhai who advised Nambi. "Leave the nasty guys and take the next flight" Nambi recalls the Father of India's Space programme having told him.
- It was in 1973 that ISRO had launched an experimental rocket(LP-006) using a 600kg thrust liquid engine. ISRO further impetus to strike a deal with the French to co-develop a 60-ton thrust liquid-fuel engine(a 100-time jump when compared to ISRO's 600kg thrust engine).
- The French had named their engine 'Viking', but the Indian-side, led by Nambi Narayanan, that negotiated the contract had decided on an Indian name - Vikas. Vikas means development in Sanskrit, but Nambi saw an adapted anagram - Vikram A Sarabhai.
- Nambi kept the real-intended meaning of Vikas a secret, owing to the bureaucratic procedures and approvals that ISRO followed when naming a project or a facility.
- From 1974 to 1980, a team of 100 Indian scientists(in different batches) led by Nambi Narayanan, had learnt to jointly develop the 60-ton thrust Viking-3 Engine, at a French facility in Vernon.
- Hence, on their own, the team had to master several other components and sub-components that went into a rocket. It would be 1982, before ISRO developed these engines and later got approval to incorporate the engines into a project—the PSLV.
- Finally, it was in 1993 that the PSLV lifted off for the first time since then, the PSLV has flown more than 50 times. With only 2 missions failing. However, the 'obstinate Vikas Engine', which was developed by Nambi Narayanan and his team had flown flawlessly in all the flights. Later, the Vikas Engine was used in the GSLV and GSLV Mk3 rockets.

Pioneer in cryogenic engine technology:

- Working as the in-charge of the cryogenics division at ISRO, Narayanan foresaw the need for liquid fuelled engines for ISRO's future civilian space

programmes and introduced the technology in India as early as the 1970s. The same technology which later he was accused of selling.

- The combination of liquid oxygen and liquid hydrogen offers the highest energy efficiency for rocket engines that need to produce large amounts of thrust. Specific impulse (a measure of the efficiency) achievable with cryogenic propellants (liquid Hydrogen and liquid Oxygen) is much higher compared to earth storable liquid and solid propellants, giving it a substantial payload advantage.
- It is important technology for India because India could launch heavy satellites (of weight more than 2500-3000kg) with the help of Cryogenic engines and its critical for the success of GSLV program.
- The technology also holds importance in the context that India was denied this technology in 1990s by the USA when India was making deal with Russian agency to transfer of technology.
- It will not just help ISRO probe deeper into space but will also bring it extra revenue, enabling it to make commercial launches of heavier satellites. By providing the cost effective and reliable services India can tap the Asian and African space markets, which are looking towards India on this front.

Conclusion

PSLV, GSLV and GSLV Mark 3, all three of India's operational spacefaring rockets have one technical feature in common all of them in one stage or another are powered by the 'Vikas' Engine. He also envisioned and worked towards developing a significantly more advanced Cryogenic Engine indigenously, to help India launch heavier satellites to the higher orbits.

15. What is a Suborbital Flight? Explain. Discuss the significance of suborbital flights.

Approach

Question can be approached by explaining the mechanism of suborbital flight in detail. Significance of the suborbital flight experiment can be highlighted as more private players will involve in space race, making our space endeavours more affordable and innovative.

Introduction

A sub-orbital spaceflight is a spaceflight in which the spacecraft reaches space, but its trajectory intersects the atmosphere or surface of the gravitating body from which it was launched, so that it does not complete one orbital revolution. For example, the path of an object launched from Earth that reaches 100 km above sea level, and then falls back to Earth, is considered a sub-orbital spaceflight.

Body

Suborbital flight

- An object traveling above atmosphere at a horizontal speed of ~28,000 km/hr (orbital velocity or escape velocity) or more goes into orbit around the earth
- Such a satellite would be accelerating towards the Earth due to gravity, but its horizontal movement is fast enough to offset the downward motion so that it moves along a circular path.
- Any object travelling slower than 28,000 km/hr must eventually return to Earth.
- Any object that launches to space but does reach sufficient horizontal velocity to stay in space falls back to Earth. This is known as flying in a suborbital trajectory.
- It means that while these vehicles will cross the ill-defined boundary of space & atmosphere (known by Karman Line), they will not be going fast enough to stay in space once they get there & thus fall back to earth.

Significance of suborbital flight

- Although the two spacecraft launched in July 2021 will not reach orbit, the accomplishment of reaching space in private spacecraft is a major milestone in the history of humanity.
- Those aboard these and all future private-sector, suborbital flights will for a few minutes be in space, experience a few minutes of exhilarating weightlessness and absolutely earn their astronaut wings.
- With Branson and Jeff Bezos kicking off private space flight, several companies are looking for customers wanting to go on suborbital or even orbital journeys.
- At Branson's Virgin Galactic, around 600 people have already paid deposits for tickets that are priced up to $250,000 (Rs 1.86 crore).
- Increased Access: It would provide increased flight access for design innovation and experimental manipulation due to high projected flight rates.
- Research: Suborbital flights will be helpful for microgravity research. Microgravity is the condition in which people or objects appear to be weightless.
- Suborbital flights could also be an alternative to parabolic flights in aeroplanes that space agencies currently use to simulate zero gravity.
- Zero Gravity or Zero-G can simply be defined as the state or condition of weightlessness.
- Cost Effective: They would be far less expensive than carrying experiments and people to the International Space Station.

What are the concerns?

- The Branson flight comes seven years after his company's first rocket, called Enterprise, crashed during a test flight, killing one of the pilots on board. The other survived after parachuting out.
- The current rocket is also not certified by the US Federal Aviation Administration, which is prohibited to do so by law until 2023.
- This is because the US government does not want to burden companies like Virgin Atlantic with regulations during their "learning" period, when they can innovate by trying out different designs and procedures.
- Passengers who go on such trips need to sign "informed consent" forms, similar to the ones before going for skydiving or bungee jumping.

Conclusion

Suborbital is an exciting experiment in the history of mankind through which various new horizons will be opened. As our generation is looking forward to establish a colony on mars, this small experiment will add more promise to it. As private players will get involved in space experiments, more affordable solutions will come to our aid.

16. Discuss the significance of protecting intellectual property (IP) to promote innovation and novelty. Do you think India's IP regime strikes a balance between innovation and public interest? Critically examine.

Approach

Candidate can start the answer with defining what is IP and it's significance simply as question demands critically analyse the IP regime of India to rightly striking balance between innovation and public interest.

Introduction

Intellectual property rights (IPR) are the rights given to persons over the creations of their minds: inventions, literary and artistic works, and symbols, names and images used in commerce. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time.

Body

Significance of IP:

- Encourages innovation: The legal protection of new creations encourages the commitment of additional resources for further innovation.

- Economic growth: The promotion and protection of intellectual property spur economic growth, create new jobs and industries and enhances the quality and enjoyment of life.
- Safeguard the rights of creators: IPR is required to safeguard creators and other producers of their intellectual commodity, goods, and services by granting them certain time-limited rights to control the use made of the manufactured goods.
- It promotes innovation and creativity and ensures ease of doing business. It facilitates the transfer of technology in the form of foreign direct investment, joint ventures and licensing.

Indian IP regime prioritizing Public interest:

- By striking the right balance between the interests of innovators and the wider public interest, the IP system aims to foster an environment in which creativity and innovation can flourish.
- The public interest considerations in IP law have informed Indian courts when deciding infringement cases, and courts have leaned towards upholding socio-economic ideals such as access to education and public health.
- Issues such as lack of affordable medicines and access to knowledge are concerns which affect millions of lives in a country like India and therefore, cannot be overlooked when deciding to what extent limitation (if any) should be placed on private rights such as intellectual property rights.
- However, when public interest exceptions are interpreted too broadly by Indian courts, it raises concerns of abuse of public interest provisions by third parties, as was the case in the DU Photocopy row.
- Indian IP regime continue to stand by the principles stated throughout this case. It support and seek to enable equitable access to knowledge for students and understand and endorse the important role that course packs play in the education of students.
- It aims to realise IPR's as a marketable financial asset, promote innovation and entrepreneurship while protecting the public interest.
- Things like Films, music, industrial drawings will also be all covered by copyright.
- It seeks to facilitate domestic IPR filings, for the entire value chain from IPR generation to commercialization.
- It aims to promote research and development through tax benefits.

Criticism of Indian IP regime:

- It discourages ever-greening of patents with minor changes without any significant improvement in effectiveness or efficiency.
- The bureaucratic setup which is allegedly corrupt, unresponsive and lacks expertise to recognize and promote innovation.
- Allegedly, no major successful initiatives have been taken by the agencies concerned either to popularize IPRs in India.

- Lack of swift and cost-effective judicial measures to enforce IPR exclusivity and the resultant plagiarism.
- Foreign investors and MNCs allege that Indian law does not protect against unfair commercial use of test data or other data submitted to the government during the application for market approval of pharmaceutical or agro-chemical products.
- Foreign investors and MNCs allege that Indian law does not protect against unfair commercial use of test data or other data submitted to the government during the application for market approval of pharmaceutical or agro-chemical products. A data exclusivity law is being demanded from the Indian side.
- India maintains high custom duties on IP intensive products as advocated by western countries impacting the investment (US puts India into priority watch list i.e., special 301 report).

Conclusion

Internationally, India has faced flak in the past for not adequately protecting IPR in its territory by giving in to public interest sentiments. While public interest is an important consideration for Indian policy-makers in matters involving IPR, there needs to be some semblance of a balance between right holders' creatot, innovators scientists interests and those of the public.

17. What is biomechanics? What are its applications? Discuss.

Approach

Candidate can approach question by defining in detail the concept of biomechanics followed by the elements of biomechanics. In second part, application of biomechanics can be given while giving a special stress on use of biomechanics in sports.

Introduction

Biomechanics is the science of movement of a living body, including how muscles, bones, tendons, and ligaments work together to produce movement. Biomechanics is part of the larger field of kinesiology, specifically focusing on the mechanics of the movement. It is both a basic and applied science, encompassing research and practical use of its findings.

Body

What is biomechanics?

- We know, mechanics is the branch of physics dealing with the motion of the bodies and the associated forces with it. It can be further divided into statics, kinematics and dynamics. The statics deals with the bodies at rest, the kinematics with the bodies in motion and the dynamics takes into account the forces responsible for the motion.
- With the increasing scope of interdisciplinary research, biomechanics has evolved as a field governing the physics of motion of living beings, such as humans, animals and the basic unit of life: cells.
- Biomechanics includes not only the structure of bones and muscles and the movement they can produce, but also the mechanics of blood circulation, renal function, and other body functions.
- Biomechanics represents the broad interplay between mechanics and biological systems.
- Biomechanics studies not only the human body but also animals and even extends to plants and the mechanical workings of cells.
- For example, the biomechanics of the squat includes consideration of the position and/or movement of the feet, hips, knees, back, and shoulders, and arms.

Elements of biomechanics

- Dynamics: Studying systems that are in motion with acceleration and deceleration
- Kinematics: Describing the effect of forces on a system, motion patterns including linear and angular changes in velocity over time as well as position, displacement, velocity, and acceleration are studied.
- Kinetics: Studying what causes motion, the forces, and moments at work
- Statics: Studying systems that are in equilibrium, either at rest or moving at a constant velocity

Application of biomechanics

The application areas of biomechanics can be broadly divided into three categories: (1) injury, (2) performance, and (3) rehabilitation.

- **Injury:** Biomechanical injury basically comprises of the failure and damage of the biosystems such as broken bones, torn ligaments and tendons, and organ impairment. The underlying principle of the research in the injury biomechanics is exploring the mechanisms of physical and physiologic responses to mechanical forces via theory of mechanics.
- Evaluation of tissue properties, studies of accidents and the design of protective equipment also comprise this category.
- **Performance:** Performance primarily refers to the mechanical activities carried out by the living beings such as walking, sitting, standing, carrying

objects and also the internal movement such as blood circulation, heart and muscle mechanics, skeletal joint kinematics.

- **Rehabilitation:** It refers to the process of recovering from injury and disease. Thus rehabilitation biomechanics comprises of the applications in the health care industries such as design and development of implants and diagnostic devices.
- It basically helps in understanding the effect of disability and the effectiveness of rehabilitation therapies on human performance.

Application of biomechanics in sports

- Sports biomechanics studies human motion during exercise and sports. Physics and the laws of mechanics are applied to athletic performance.
- Equipment: Biomechanics can be used in the design of sports equipment, clothing, shoes, and the fields and facilities where sports are played. For example, a shoe can be designed for the best performance for a middle-distance runner or a racket for the best grip.
- Individuals: Biomechanics can be applied to individuals, analyzing their movements and coaching them for more effective movement during exercise and sports movement. For example, an individual's running gait or golf swing can be filmed and recommendations made for them to change and improve it.
- Injuries: Biomechanics can be applied to studying the causes, treatment, and prevention of sports injuries. The research can analyze the forces at work that can lead to an ankle sprain and how shoe design or the playing surface might reduce the risk of injury.
- Training: Biomechanics can study sports techniques and training systems and develop ways to make them more efficient. This can include basic research into how hand position affects propulsion in swimming. It can propose and analyze new training techniques based on the mechanical demands of the sport, aimed at resulting in better performance.

Conclusion

By studying how the human body naturally wants to move we can remove stress and pressure on the bones, joints, muscles and ligaments. This results in improved athletic performance, reduced injuries and heightened general wellbeing. Athletes and general population of all ages and skill levels can benefit from biomechanical analysis whether it's for pain reduction or to increase top level performance.

18 Identify and discuss various pollution control and mitigation technologies .

Approach

A simple straightforward question where candidates need to write about pollution control technologies in first part, in second part of answer write about what mitigation measures can be taken to reduce adverse effect of pollution .

Introduction

Pollution is any undesirable change in physical, chemical or biological characteristics of air, land, water or soil. Agents that bring about such an undesirable change are called as pollutants .Pollutants can be solid, liquid or gaseous substances present in greater concentration than in natural abundance and are produced due to human activities or due to natural happenings.

Body

India accounts for two-thirds of the world's most polluted cities — 21 of the most polluted 30 cities. Globally some 9 million premature deaths a year are associated with air pollutants, such as fine particulate matter, known as PM 2.5. Regrettably, 14 of the world's 20 most polluted cities are in India.

Air pollution

There are four main sources of air pollution: Stationary sources such as industries, power plants and factories; mobile sources or vehicular transport; area sources such as agricultural tracts and cities; and natural sources, which include volcanoes, cyclones and wildfires.

Initiatives by the Government-

National Clean Air Programme
- A long-term, time-bound, national-level strategy to tackle the increasing air pollution problem across the country in a comprehensive manner. The total tentative cost of NCAP is estimated at Rs 637 crore.

Objective: Comprehensive management plan for prevention, control and abatement of air pollution, besides augmenting the air quality monitoring network across the country.

Focuses on: Collaborative and participatory approach covering all sources of pollution and coordination between relevant central ministries, state governments, local bodies and other stakeholders.Intensive awareness, training and capacity-building drive, with specific impetus on augmentation of manpower and infrastructure facilities of the Central Pollution

Control Board (CPCB) and the state pollution control board (SPCBs)

- A credible, transparent and accountable data collection and monitoring system that is available for timely swift action is to be ensured
- Increasing the number of monitoring stations, data dissemination, public participation on planning and implementation
- Setting up of air information centre for data analysis, resource apportionment studies, national inventory and rural monitoring stations, besides guidelines for indoor air pollution.

The Central Pollution Control Board (CPCB)-
- It is a statutory organisation under the Ministry of Environment, Forest and Climate Change (Mo.E.F.C).
- It was established in 1974 under the Water (Prevention and Control of pollution) Act, 1974.
- It is also entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981.
- It provides technical services to the Ministry of Environment and Forests under the provisions of the Environment (Protection) Act, 1986.
- It Co-ordinates the activities of the State Pollution Control Boards by providing technical assistance and guidance and also resolves disputes among them.
- It is the apex organisation in country in the field of pollution control.

LiDAR (Light Detection and Ranging)-
- Being used to vertically monitor the air quality of Delhi-NCR
- To track the evolution of a pollutant over time
- To detect leakage of organic pollutants in storage facilities and industrial plants, such as oil refineries
- To observe the structure and height of mixing layers
- To measure the transport and diffusion of plumes or clouds of particulates
- To remotely determine smoke-plume opacity

Climate & Clean Air Coalition-
- Unites governments, civil society and private sector, committed to improving air quality and protecting the climate in next few decades by reducing short-lived climate pollutants (SLCP) across sectors
- By the governments of Bangladesh, Canada, Ghana, Mexico, Sweden and the United States, along with the United Nations Environment Programme (UNEP)
- Objective: To address short-lived climate pollutants.
- Initial focus on: Methane, black carbon, and HFCs

National Air Quality Index (AQI).
- The AQI is an index for reporting daily air quality. It tells how clean or polluted the air is.
- The higher the AQI value, the greater the level of air pollution and the greater the health Concern.
- Research studies have attributed the key sources of PM2.5 in summer to be: dust and construction activities (35%), transport sector (20%) and industry (20%).

Centre-run System of Air Quality and Weather Forecasting and Research (SAFAR)
- It was indigenously developed by Indian Institute of Tropical Meteorology, Pune.
- It is run by India Meteorological Department (IMD).

- The objective is to provide Real-time air quality index on 24×7 basis with colour coding along with 72-hour advance weather forecast.
- Another goal is to issue health advisory to prepare citizens well in advance.

Noise pollution

- is considered as environmental pollution, even though it is thought to have less damage on humans than water, air or land pollution. But people who are affected by severe noise pollution know that it is a massive issue that needs attention. It interferes with normal activities such as:
- It diminishes one's quality of life in terms sleeping, conversation and peaceful healthy environment.
- Hearing loss with living beings.
- Oil drills, submarines and other vessels inside ocean affect the marine environment due to SONAR range.

There are way-outs to deal with noice pollution -

- Usage of noisy vehicles should be banned.Usage of cycling should be promoted by providing high subsidies as well as making awareness regarding health benefits.
- Setting up of industrial and manufacturing plants should be at far sighted place.
- Community law enforcers and people should keep check the misuse of loudspeakers,worshipper s and other outdoor parties.
- Planting trees along roads,industries and in residential areas.

GreenCo Rating System

- GreenCo Rating system has been acknowledged in India's Intended Nationally Determined Contribution (INDC) document.
- It is used as a proactive voluntary action of Indian industry / private sector towards combating climate change.
- It is developed by Confederation of Indian Industry (CII).
- CII is a non-government, not-for-profit, industry-led and industry-managed organization.

Water Pollution

- Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading water quality and rendering it toxic to humans or the environment.
- Some of the causes for water pollution are sewage water, industrial Wastes, agricultural sources, thermal and radiation pollution, marine pollution, invasive species, underground water pollution etc.

Indian Initiative to control water pollution-
ECOMARK Scheme:

- The Government has instituted this scheme on labeling of Environment Friendly Products.

- The scheme is operating on a national basis and provides accreditation and labeling for household and other consumer products which meet certain environmental criteria along with quality requirements of the Indian Standards for that product.
- The Ecomark Scheme covers various product categories like Soaps and Detergents, paints, food items etc.

Conclusion

Improving access to public transport, electrifying the transport fleet, raising regulations or pricing emissions on power plants and factories, and developing new technology alternatives to polluting industries, such as steel and cement – all of these measures lead to cleaner air (and lower carbon emissions).Scientific warnings do not indicate the time and place of calamities but do call for confronting air pollution and global warming and strengthening health systems before the next health emergency that is surely going to happen. Health crisis has cleaned up air. It is global community's duty to carry that forward.

19. Discuss the applications of blockchain in governance and internal security.

Approach

Candidate can start with basic information on blockchain technology used in different sectors and it's reasons. Explain the block chain technology how it works. And then simply elaborate on application in governance and internal security.

Introduction

Until now, the blockchain technology has been most prominently heard with reference to cryptocurrencies. It has been known as a technology that enables the Bitcoins and Ethereums of the world but in recent time it has also been used in governance for better citizen service and managing internal security.

Body

Blockchain technology:

- Blockchain derives its name from the digital databases or ledgers where information is stored as "blocks'' that are coupled together forming "chains".
- It offers a singular combination of permanent and tamper-evident record keeping, real-time transaction transparency and auditability.
- Any new information added or altered via a new block is to be vetted and approved by over half the total users.

Application of blockchain technology in governance:

- Blockchain technology can help in ensuring good governance. It ensures transparency of the public records through the usage of a digital form platform and allows auditing of government documents. Moreover it allows to maintain the authenticity of the document and clearly reduces the processing time.
- Transparency: Blockchain allows traceability of information and ensures nothing is unduly modified. This is a big advantage in enhancing democratic governance and adds accountability.
- Data protection: Blockchain allows users to own and control their data through private and public keys. The owners also decide when and how a third party can access this information.
- Improved efficiency: The technology eliminates go-betweens from the process and reduces the risk of human errors and time consumed in hierarchical approvals.
- Manpower requirements: Blockchain will significantly reduce the manpower requirements.
- Singapore: The Singapore government has introduced Project Ubin, a blockchain technology-based initiative in the banking industry for inter-bank and cross-currency payment transactions with Canada and Europe.
- Blockchain & Indian government: In 2020, Tamil Nadu became the first Indian state to introduce blockchain policies. Chief minister Edapaddi K Palaniswami made this announcement during the Connect 2020 event. Tamil Nadu Blockchain Policy of 2020 outlines steps to bring accountability, creating awareness among government employees, and creating an ecosystem by involving entrepreneurs and communities.

Blockchain technology application in internal security;

- This is another major benefit that Blockchain offers. Technology is assumed to offer high security as all the transactions of Blockchain are cryptographically secure and provide integrity. Thus instead of relying on third-party, you need to put your trust in cryptographic algorithms.
- Cybersecurity is the practice of protecting systems and networks from digital attacks which aim to access, change or destroy digital information either to extort money or sensitive data. With the increasing reliance on technology and data, it becomes very important to reinforce security measures to protect digital data and transactions.
- Cyberattacks can be carried out using various malware such as viruses, Trojans, Rootkits, etc. Some common types of cyberattacks are Phishing, Man in a middle (MITM) attack, Distributed denial of service (DDoS) attack, SQL injection, and Ransomware attacks.

Conclusion

The decentralised nature of the blockchain technology applications makes it a perfect fit for many industries to carry out secure business transactions. The proper use of blockchain technology allows us to avoid the use of middlemen or partner platforms in a peer-to-peer network, reduce reception time, fraudulent proof.

20. Regulations must keep up with technological advances as new issues like privacy, misinformation, censorship, and ethical applications arise. Elucidate.

Approach

Candidate can approach the question by briefly analysing the changing nature of technology and regulation of the same. Emerging issues can be given in the beginning, followed by the issues arising out of absence of regulator. In the end, way ahead can be given along with the conclusion.

Introduction

The emergence of new technologies has digitalised markets, societies and nations. Once perceived as a strength, this proliferation of technology is now also a vulnerability. It has made tech-governance more political and social, and less about the traditional modes of regulation such as permissions, standards and tariffs. India is among the most technology adept nations, a function of its people's comfort with IT products and services as well as its late-mover advantage. It must now engage with a spectrum of evolving needs around law and regulation.

Body

Technology and the emerging issues

- Three sets of issues emerge here - understanding the nature of technology-linked risks; assessing the challenges to governance; and being imaginative in embracing new modes of regulation. Risks, themselves are creations of enhanced democratic access.
- Improved access is credited with enabling financial inclusion, efficiency in education and healthcare, and fostering local e-commerce as well as global trade. However, a large user base is also a double-edged sword.
- As a result, corrective interventions need to be nimble and at digital velocity and population scale.
- A 2021 study found a high rate of social media misinformation in India, and attributed this in part to the country's higher Internet penetration rate, driven by smart phones.

- Between June-July 2021 alone, Facebook received 1,504 user complaints in India – with a significant proportion of these related to bullying, harassment or sexually inappropriate content.
- Concerns are also emerging across other digital ecosystems, such as online gambling and crypto-assets.
- The mobile phone is now not only a communication device, but a crime scene and also an unsafe personal space. Moreover, several state-level laws regulate or entirely prohibit betting and gambling.
- Offshore gambling websites often channel black money, engage in illicit transactions and launder wealth through financial intermediaries.
- Recent investigations by bodies like the Enforcement Directorate have revealed instances of locals being hired to open bank accounts and trade through various online wallets, revealing gaps in due diligence mechanisms.

What are the issues in the absence of a regulator?

- Data Sovereignty: India's consumer internet is dominated by American Big Tech. Absence of regulator is therefore an associated issue of Sovereignty.
- Implications on Freedoms: Presence and absence of regulator has implications for freedom of expression because its content rules and broader policy determinations will determine our online public squares.
- Continuation of offences: Repeated offences on data breaches and sharing of data between platforms have been ignored — in the absence of a regulator.
- Complexity of Regulation: India has conventionally resorted to broad trade and market restrictions — such as blocking — rather than nuanced regulation of the digital space.
- Regulation can be misconstrued as de-globalisation: In a digitally integrated world, globalisation of ideas and information has helped economies find novel ways to power growth and inclusion. Denying digital access to certain services be it through app bans or internet shutdowns, is an act of digital de-globalisation.
- Existing regulations misused: Section 69A of the Information Technology Act, which gives the government the provision to block public access to specific webpages, websites and mobile applications, has been used extensively, and often without accountability. In 2020 alone, India lost $2.8 billion due to internet shutdowns.
- Proper Governance framework will act as propeller of growth: A strong and consistent governance framework together with a digitally empowered Indian consumer will be a great step in building an Atmanirbhar Bharat.

Way ahead

- For governments and regulators, the role is no longer one of a gatekeeper that has the ability to prevent or permit activities online; it is becoming more of an ecosystem shaper and reducer of public bads.

- For the digital economy to flourish, it is important to evolve approaches that help resolve systemic and structural risks.
- It is time to reassess what is good, what is bad and what is ugly in this new digital landscape.
- Government would do well to retain this nimbleness and become a co-curator of relatively safe tech platforms, services and products of the future that respond to Indian jurisdiction rather that off-shore the production of risks along with the rewards.
- Tech regulation at population scale is akin to writing a new constitution for a digital nation.
- What we need today is new thinking and a new imagination of the digital world as not merely a virtual extension of the real, but an entirely different paradigm.
- There needs to be a clear-eyed understanding of what is legal, what is illegal and what may be illegal and yet requires regulations to serve and protect users and citizens.

Conclusion

Decentralised and unregulated digital spaces are ought to become a reality of future. When it comes to regulation, more democratic and shrewd approach should be adopted while drafting the policy. As the policies of yesterday are becoming obsolete in an unimaginable small time frame, policymakers with vision and foresight should make laws that will balance the freedom of creators and safety of users.

21. The evolving dynamic of geopolitics necessitates the indigenization of technology. Comment. Also, examine the recent developments in the field of indigenous defense technologies in India.

Approach

Question can be approached by explaining geopolitics necessities involved in indigenisation of technology against hostile countries. Also explain why India need indigenisation highlight some recent developments related to it.

Introduction

A strong and well-equipped military provides a country the immunity to resist attack and thwart unprovoked aggression from external sources. It works as a defence mechanism and reflects the country's military capability and capacity to defend itself against the hostile countries.

Body

Need for indigenisation of defence technology:

- Lack of R&D: Expenditure is only around 5-6% of defence budget which is inadequate. India's Defence Research and Development Organization (DRDO) is ill equipped to produce the kind of high-quality research and tech that's essential for domestic companies to flourish.
- Technological backwardness – While developed countries have advanced technologies and developing next generation defence equipment, India lags behind. E.g. LCA Tejas of India vs F-22 Raptor with stealth capabilities.
- High import of components: The Comptroller and Auditor General of India (C&AG) highlighted the 90% import dependency of Hindustan Aeronautics Ltd (HAL) for 'raw materials and bought out items' for the production of indigenous.
- Foreign collaboration has been mainly for finished products procurement than on technology transfer. E.g. Rafale deal with France, Howritzer Artillery guns with USA, S-400f missiles with Russia etc., None of them involve technology transfer.

Importance of Developing indigenous defense technology:

- To maintain its regional autonomy: India needs to assert its presence and sovereignty over the border regions and for that, it needs to have modernised defence products and strategic autonomy over such defence products. This strategic autonomy can be achieved by having a self-reliant defence industry which would ultimately strengthen the Indian economy as well.
- To create a robust security framework: India requires an overhaul of its defence products to meet the current requisites of modern warfare. India needs to strengthen its surveillance system which requires inducting of modernised radars and drones so that suspicious activities and trespassing at the border areas could be detected at the earliest.
- Promoting investments in R&D and production in the defence sector: Will reduce dependency on imports which will lead to a reduction in the foreign exchange expenditure and enhance the level of operational preparedness.
- Restructuring of defense with Indian based requirements: India with vast landscape with terrain like ladakh siachen and coastal areas.
- Strategic Capability: self sufficient and self reliant defence industry will place India among the top global powers.
- Nationalism and Patriotism can increase with indegenious production of defence equipment, that in turn will not only boost the trust and confidence of the Indian forces but will also strengthen a sense of integrity and sovereignty in them.
- Affect sovereignty: Depending on other countries for arms would affect the sovereignty of India with respect to military policies and decisions.

Government policies are promoting indigenous defence production like

- Research projects: through schemes like Innovations for Defence Excellence (iDEX), funding under Defence Innovation Fund (DIF), Technology development fund
- Under the new Defence Procurement Procedure (DPP) 2016 promulgated in 2016, the 'Make' procedure has been simplified.
- Strategic partnership model was announced which has promoted private sector participation.
- Promotion through Make In India policy with local sourcing requirements, tax benefits etc.,
- 3 facilities were inaugurated – Ordnance Factory Board (OFB) and BEML's (Bharat Earth Movers Limited) Industrial Design Centre at its Bangalore Complex.
- HAL- designed and developed Light Combat Helicopter were handed over to the Chief of the Air Staff
- Drones and UAVs designed and developed by Indian startups were given to the Chief of the Army Staff
- DRDO designed and Bharat Electronics Limited (BEL) manufactured Advanced Electronic Warfare suite for naval ships were handed over to the Chief of Naval Staff
- Besides, the Prime Minister also laid the foundation stone of the Rs 400 crore project at Jhansi node of the UP Defence Industrial Corridor.
- In addition to Jhansi, the corridor has nodes at Agra, Aligarh, Chitrakoot, Lucknow and Kanpur.
- For the Jhansi Node, the state government has made nearly 1,034 hectares of land available. The facility will involve an investment of Rs 400 crore.

Conclusion

Thus, though India has yet to reach its potential in defence indigenization, the production has increased and is being continuously promoted. Further promotion through streamlining private participation with long term policies, increasing r&d expenditure, establishing defence industrial corridors etc., will not only strengthen our defence capabilities, but also generate employment opportunities, improve supply chain management and technological development.

22. How does DNA fingerprinting work? Explain. What are its potential applications?
Discuss.

Approach

Question is straight forward. Candidate can define DNA fingerprinting. In body part, working of the technique can be given followed by the potential application of the same. In the end conclusion can be given.

Introduction

DNA fingerprinting is a laboratory technique used to determine the probable identity of a person based on the nucleotide sequences of certain regions of human DNA that are unique to individuals. DNA fingerprinting is used in a variety of situations, such as criminal investigations, other forensic purposes and paternity testing.

Body

How does DNA fingerprinting work?

- DNA is short for deoxyribonucleic acid, which is inside of every cell in body. It's a chain of chemical compounds that join together to form permanent blueprints for life.
- DNA is our blueprint, the basis of life, encodes proteins, and regulates gene expression. It is made up of sugar, phosphate, and nitrogenous bases. DNA is located on chromosomes. The whole set of DNA or chromosomes is known as the genome.
- Interestingly, there are several regions in our genome that are unique and hypervariable which differ among persons or organisms. That unique region has been applied for DNA fingerprinting.
- These compounds are called bases, and there are 4 of them. They pair up with another to form what are called base pairs. DNA has about 3 billion of these couples. The way they're strung together tells our cells how to make copies of each other.
- The complete set of our compounds is known as a genome. More than 99.9 % of everyone's genome is exactly alike (100% if you are identical twins). But the tiny bit that's not is what makes us physically and mentally different from someone else.
- DNA fingerprinting uses chemicals to separate strands of DNA and reveal the unique parts of genome. The results show up as a pattern of stripes that can be matched against other samples.
- Alec Jeffreys developed this technique in which he used satellite DNAs also called VNTRs (Variable Number of Tandem Repeats) as a probe because it showed the high level of polymorphism.

Application for DNA fingerprinting

- Forensic Science: Biological materials used for DNA profiling are: Blood, Hair, Saliva, Semen, Body tissue cells etc. DNA isolated from the evidence sample can be compared through VNTR (Variable number of tandem repeats) prototype. It is useful in solving crimes like murder and rape.
- Paternity and Maternity Determination: A Person accedes to his or her VNTRs from his or her parents. Parent-child VNTR prototype analysis has been used to solve disputed cases. This information can also be used in inheritance cases, immigration cases.

- Personal Identification: It utilizes the concept of using DNA fingerprints as a sort of genetic bar code to pinpoint individuals.
- Diagnosis of Inherited Disorders: It is also useful in diagnosing inherited disorders in both prenatal and newborn babies. These disorders may include cystic fibrosis, hemophilia, Huntington's disease, familial Alzheimer's, sickle cell anemia, thalassemia, and many others.
- Development of Cures for Inherited Disorders: By studying the DNA fingerprints of relatives who have a history of some particular disorder, DNA prototypes associated with the disease can be ascertained.
- Detection of AIDS: By comparing the band of HIV "RNA" (converted to DNA using RTPCR) with the bands form by the man's blood, person suffering with AIDS can be identified.
- Breeding Program: Breeders conventionally use the phenotype to evaluate the genotype of a plant or an animal. As it is difficult to make out homozygous or heterozygous dominance from appearance, the DNA fingerprinting allows a fastidious and precise determination of genotype. It is basically useful in breeding race horses and hunting dogs.

Conclusion

Scientists have been using DNA fingerprinting for many different applications for a long time. However, it has become more popular in crime scene investigation and settling parental identification claims. The technique is accurate, reliable, fast, and cheap though changes may occur timely. Traditionally, researchers have relied on restriction digestion, but PCR has made it more aggressive.

23 Are you concerned about the possibility of the robots and AI technologies eroding employment opportunities ? do these fears have any basis in reality ? substantiate your views .

Approach

A simple straightforward question where candidates need to write about artificial intelligence and is there any chance and possibility that robots and AI technologies will erode employment opportunities, in second part of answer write about do these fears have any reality basis. candidates should give their Give your opinion about it and substantiate their views .

Introduction

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. And, Machine Learning is a current application of AI based around the idea that we should really just be able to give machines access to data and let them learn for themselves.

Today with broader range of robotics technologies at or near commercialization including stationary robots, are attracting significant business interest in adoption.

Body

Recently , according to forecasters 'future of jobs forecast 'report published that by 2040 around 63 million jobs are expected to be lost to automation.

- There is fear of massive job loss and millions unemployed as AI and robots are implemented on a global scale keeping in mind productivity and labour laws.
- Augmentation of existing jobs through technology may free up workers from the majority of data processing and information search tasks. Their adoption is likely to make many of today's jobs redundant, eliminating routine and intermediary tasks.
- The study of 46 countries and 800 occupations by the McKinsey Global Institute found that up to one-fifth of the global work force will be affected. Up to 800 million global workers will lose their jobs by 2030 and be replaced by robotic automation.

How automation reduces jobs?

- It is now widely accepted that technological advances, especially ones that make machines more like humans such as artificial intelligence are putting people out of work and will destroy more jobs in the future.
- In the past decades, computers, cash machines and self-serve pumps have largely replaced secretaries, bank tellers and gas station attendants, respectively.
- Google, Uber and Tesla are all working on self-driving vehicles, beginning with those that make long-haul journeys
- Technology created jobs tend to be concentrated in cities like London, San Francisco, New York and Stockholm, which drives up prices, creates inequality and makes it difficult for people to live in or move to places where new jobs are emerging.
- Coming years will likely only see this problem intensify, as jobs that involve any kind of routine or repetitive work – mental or physical – are increasingly at risk of being ousted by automation.
- As X-rays and other medical records are digitised and computer algorithms become better at interpreting them, radiologists, for example, find themselves collaborating with machines, acting more as fact checkers than as medical sleuths
- Jobs that used to be very complex, idiosyncratic and interesting start to look more like computer operator jobs, just putting in data and interpreting screen readouts.
- Innovation is boosting pay for highly skilled workers while having a more negative impact on those with low to medium skills.

- New technologies will give rise to new job roles, occupations and industries, with wholly new types of jobs emerging to perform new work tasks related to new technologies.
- Large workforce will be supported in high-value tasks such as reasoning and decision-making. There will be greater need for workforce with tech-based skill sets.

World Economic Forum (WEF) in 'Future of Jobs' report reads:

- As technological breakthroughs rapidly shift the frontier between the work tasks performed by humans and those performed by machines and algorithms, global labour markets are likely to undergo major transformations.
- These transformations, if managed wisely, could lead to a new age of good work, good jobs and improved quality of life for all, but if managed poorly, pose the risk of widening skills gaps, greater inequality and broader polarization.
- Thus it is important for government to address the impact of new technologies on labour markets through.
- Upgraded education policies aimed at rapidly raising education and skills levels of individuals of all ages, particularly with regard to both STEM (science, technology, engineering and mathematics) and non-cognitive soft skills, enabling people to leverage their uniquely human capabilities.
- Relevant intervention points include school curricula, teacher training and a reinvention of vocational training for the age of the Fourth Industrial Revolution, broadening its appeal beyond traditional low and medium skilled occupations.

Conclusion

Many experts have described the rise of automation as one of the most important economic and social developments in history. The World Economic Forum (WEF) has characterized it as the fulcrum of a 4th Industrial Revolution. It may cause unemployment, unease in the mindset of masses, and even social conflict at many conflicts at many reasons. In the short run, it is very difficult to predict who will get the most of the benefits however better policy guidelines, better regulations, and social security measures will essentially bring overall goodness to the society.

24. What are generic drugs? Why are they so critical? Describe India's regulatory regime for drug patents.

Approach

Candidates are expected to write about what is generic drugs and try to inform about the existing regulations and laws related to generic drugs and then concerns problem associated due to generic drugs can also be mentioned and do end with the way forward.

Introduction-

A generic drug is a pharmaceutical drug that contains the same chemical substance as a drug that was originally protected by patents. Generic drugs are allowed for sale after the patents on the original drugs expire.

Body

Generic drugs:

- The active chemical substance is the same, the medical profile of generics is believed to be equivalent in performance.
- A generic drug has the same active pharmaceutical ingredient (API) as the original, but it may differ in some characteristics such as the manufacturing process, formulation, excipients, color, taste, and packaging.

Criticality of generic drugs:

- Generics do not involve repetition of extensive clinical trials over the years, unlike brands that undergo extensive R&D procedure.
- Hence, generics' manufacturing cost is less, and so are their prices.
- A generic drug is a copy of drug medication created to be the same as an already marketed brand-name drug.
- It equals in dosage form, safety, strength, route of administration, quality, performance characteristics, and intended use.
- There is an increased push by the government for generic drugs, for affordable healthcare.
- But the concerns with quality of the generics call for a relook on this 'generic-only model'.

Regulatory regime:

- Past experiences show that even if the government caps the margins or prices of the consumables, hospitals increase the charges for procedures and other services and refuse to pass on the benefit to the patients.
- For instance, in the case of cardiovascular stents, immediately after the prices were capped, hospitals increased the charges for procedures.
- Regulatory capture is a phenomenon when a regulatory body gets influenced by the economic interests of special interest groups that dominate the industry, rather than those of the general public.
- Regulatory capture is a form of government failure, where government agencies fail to perform their duties,for example, even with Drug Price Control Order (DPCO) 2013 , price of anti-diabetic drug Metformin was manipulated.

- Neither the Department of Pharmaceuticals nor the National Pharmaceutical Pricing Authority has the institutional ability to monitor prices of medicines at the state level. Such capacities are key to enforcement of any regulation.
- In 2017, Central Govt, ordered doctors to prescribe generic formulations of medicines, as opposed to specific brands.
- Medical Council India (MCI) also ordered the medical community to follow its 2016 notification in which the MCI had amended the Clause 1.5 of the Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations, 2002 mandating doctors to prescribe medicines by generic names in place of brand names.

Different concerns:

- Due to profit driven nature of any pharmaceutical product, pharmacies in India are not enthusiastic to sell generic medicine.
- A lot of customers aren't happy when low-cost medicines are handed out to them. They feel that the quality of the medicine directly depends on the cost of it.
- The Drugs Technical Advisory Board (DTAB) advisory that retailers should maintain a separate rack/shelf solely for the storage of "generic medicines sold in proper name" is not followed.
- At least 90% of the Indian domestic pharmaceutical market comprises drugs sold under brand names. There simply are not enough generic name equivalents of branded medicines sold.
- About half the market is for fixed-dose combinations (FDCs) of drugs, a further half of them irrational.
- Many FDC drugs contain even eight or nine medicines. To write, and remember, the constituent of FDC drugs in generic names is impractical, considering that there would be thousands of FDC brands.
- Jan Aushadhis, which are pharmacies selling only generic name medicines to the full extent possible, are only about 300 in numbers, thus excluding a significant number of population.
- Generic drugs have been found to contain less than the required amount of active pharmaceutical ingredient (API), rendering them ineffective.
- Individuals suffering from illness are especially susceptible to infections, and inspections of generic drug plants reveal pest infestations and dilapidated infrastructure.

Way forward

- There is a need to have in place stringent criteria for government agencies to ensure that there is no difference in the dose, efficacy, potency and side-effects between generics and the branded ones.
- The government should ensure that all pharmacies have qualified pharmacists and that basic quality is maintained for all generics produced in India.

- In short, there should be a sort of star-rating for quality certification, helping people to understand the quality of the generic.
- The government's intention to promote generics will reach its goal only if these three important factors (clarity in definition, safe quality and standardised quality certifications along with qualification of pharmacists) are considered.

25. Provide a brief overview of the origins of the conflict between China and Taiwan. In what ways does it impact global politics today? Explain.

Approach

Student can elaborately describe the evolution of conflict between Taiwan and china. In the second part, impact of events on global politics can be described while exploring all the possibilities. In the end, conclusion can be given.

Introduction

Taiwan, officially known as the Republic of China (ROC), is an island separated from China by the Taiwan Strait. It sits in the so-called "first island chain", which includes a list of US-friendly territories that are crucial to US foreign policy. It has been governed independently of mainland China, officially the People's Republic of China (PRC), since 1949.

Body

History of Taiwan- china conflict

- Then Taiwan was administered by China's Qing dynasty from 1683 to 1895. The largest demographic groups on the island now are Hakka Chinese who fled the mainland in the 17th century.
- The Qing dynasty had to surrender Taiwan to Japan in 1895 after it lost in the First Sino-Japanese War.
- After World War II, Japan surrendered and relinquished control of territory it had taken from China. The Republic of China (ROC) which was one of the victors in the war began ruling Taiwan with the consent of its allies, the US and the UK.
- During the civil war in China, Mao Zedong's Communist army took the reign of the mainland by defeating the Kuomintang (KMT). The remnants of the KMT government and their support fled to Taiwan in 1949.
- They established a government in exile in Taiwan which led the island for the next 25 years. The successors allowed more democratization over the years as the locals protested against the authoritarian rule.

- President Lee Teng-hui, known as Taiwan's 'father of democracy, led constitutional changes, which eventually made way for the election of the island's first non-KMT president, in 2000.
- The present-day conflict arose out of the fact that the ROC government-in-exile at first claimed to represent the whole of China, which it intended to re-occupy. It held China's seat on the United Nations Security Council and was recognized by many Western nations as the only Chinese government.
- By the 1980s Taiwan relaxed rules on visits and investments in China. In 1991, it proclaimed that the war with the People's Republic of China was over.
- China proposed the so-called 'one country, two systems' option, which it said would allow Taiwan significant autonomy if it agreed to come under Beijing's control.
- Taiwan rejected the offer and Beijing's insisted that Taiwan's ROC government is illegitimate – but unofficial representatives from China and Taiwan still held limited talks.

Effect of conflict on global politics

- Taiwan is an island, roughly 100 miles from the coast of south east China. It sits in the so-called "first island chain", which includes a list of US-friendly territories that are crucial to US foreign policy. It is the 5th largest economy in Asia and a global leader in Integrated Circuit Chip manufacturing.
- Taiwan is a member of WTO and Asia-Pacific Economic Corporation (APEC) under the name of "Chinese Taipei". Currently, only 13 countries recognise Taiwan as a sovereign country.
- People's Republic of China (PRC) always maintain that Taiwan as an inalienable part of mainland China and consider Taiwan as a breakaway province. To prove that the People's Republic of China introduced "One country Two systems approach" and "One China Policy".
- There is a diplomatic shift in the policy of the US and Taiwan. In recent years US engaged with Taiwan and supporting Taiwan's membership to World Health organisation (WHO).
- Taiwan Semiconductor Manufacturing Company (TSMC) recorded a market share of just over 53 percent in the global semiconductor market. Hence China claims Taiwan.
- Relations between Taiwan and China appear to have deteriorated sharply following United States House Speaker's visit to Taipei, which Beijing condemned as "extremely dangerous".
- Officially, the U.S. government abides by a "One China" policy that recognizes the People's Republic of China as the country's only legitimate government and acknowledges—but doesn't endorse—Beijing's claims over Taiwan.
- Since 1979, U.S. policy toward the defense of Taiwan has been governed by a law known as the Taiwan Relations Act, which holds that any attempt to determine Taiwan's political future through anything other than peaceful means constitutes a threat to American interests. The act commits the U.S. to

sell weapons to Taiwan for its self-defense, but is conspicuously silent on whether the U.S. is obligated to defend Taiwan in the event of an attack.

- For decades, Washington has strategically avoided making a commitment either way, in the hope that uncertainty about its posture will prevent both Beijing and Taipei from making moves to upset the status quo.
- The Chinese economy is far more interconnected with the global economy than Russia's Economy. Thus, China will look to mind the gap very carefully if they want to launch an invasion of Taiwan, especially so close to the Ukraine crisis.
- After all, the Taiwan issue is not just about a moral question of allowing the destruction of a successful democracy, or about international ethics, the day after China's invasion of Taiwan will mark a very different Asia, regardless of what happens.
- In addition, India can rethink the One China Policy and separate its relationship with mainland China from that with Taiwan just as China is expanding its involvement in Pakistan occupied Kashmir (PoK) through its ambitious project China Pakistan Economic Corridor (CPEC).

Conclusion

Any sort of escalation between Taiwan and China may have multidimensional impacts. For example, the semiconductor chips supply chain may get affected, resulting in a global slowdown in manufacturing and increased inflation. From japan to Australia, many indo pacific countries may jump in the conflict and it will mark the unfortunate events for asia. A peaceful resolution issue by means of diplomacy and talks must be pursued by all participating actors.

26. Analyse critically the recent measures adopted for the protection of the western ghats, Is there a feasible model for the regions sustainable development? Examine.

Approach

A simple straightforward question where candidates need to write about western ghats and what measures adopted for protection of western ghats, in second part of answer write about some feasible models for sustainable development of western ghats.

Introduction

Western Ghats consist of a chain of mountains running parallel to India's Western Coast and passing from the states of Kerala, Maharashtra, Goa, Gujarat, Tamil Nadu and Karnataka. They are home to tropical evergreen forests, as well as to 325 globally threatened species but Mindless construction and land use has only exacerbated all these impacts, particularly in ecologically vulnerable regions such as

the Western Ghats. hence for protecting this world heritage government come up with many measures.

Body

The Western Ghats is an extensive region spanning over six States. It is the home of many endangered plants and animals. It is a UNESCO World Heritage site.It is one of the eight "hottest hot-spots" of biological diversity in the world.

Significance:

- The Ghats influence the Indian monsoon weather patterns that mediate the warm tropical climate of the region.
- They act as a barrier to rain-laden monsoon winds that sweep in from the south-west.
- Western Ghats are home to tropical evergreen forests, as well as to 325 globally threatened species.

Threats to Western Ghats:

- Developmental Pressures: Urbanization together with agricultural expansion and livestock grazing are posing serious threats to the region.
- About 50 million people are estimated to live in the Western Ghats Region, resulting in developmental pressures that are orders of magnitude greater than many protected areas around the world.
- Biodiversity Relates Issues: Forest loss, habitat fragmentation, habitat degradation by invasive plant species, encroachment and conversion also continue to affect the Ghats.
- Fragmentation caused by development pressure in the Western Ghats is shrinking the availability of wildlife corridors and suitable habitats outside Protected Areas.
- Climate Change: In the intermediate years, the climate crisis has gained momentum:
- In the past four years (2018-21), floods have ravaged the ghat areas of Kerala thrice killing hundreds of people and delivering an overwhelming blow to infrastructure and livelihoods.
- Landslides and flash floods ravaged the ghat areas of Konkan in 2021
- Cyclones are also gaining intensity with the warming of the Arabian Sea leaving the west coast especially vulnerable.
- Threats from Industrialization: More polluting industries, quarries and mines, roads, and townships are likely to be planned due to the absence of the Western Ghats ESA policy.
- This implies more damage to the fragile landscape of the region in future.

Committees for Western Ghats:

- Gadgil Committee (2011): Also known as the Western Ghats Ecology Expert Panel (WGEEP), it recommended that all of the Western Ghats be declared as the Ecological Sensitive Areas (ESA) with only limited development allowed in graded zones.
- Kasturirangan Committee (2013): It sought to balance the development and environment protection in contrast to the system proposed by the Gadgil report.
- The Kasturirangan committee recommended that instead of the total area of Western Ghats, only 37% of the total area should be brought under ESA and a complete ban on mining, quarrying and sand mining be imposed in ESA.
- Procedural Delays in Western Ghats ESA Declaration:
- The Centre has kept the notification of the Western Ghats ESA pending since 2011.
- Since the recommendations of the Kasturirangan Committee, four draft notifications have been issued but to no avail.
- More recently, the Central Government extended the deadline till June 30, 2022 to notify the 2018 draft Western Ghats ESA notification.
- While a six-month extension may seem inconsequential, implementation of the Western Ghats ESA policy has been pending for over 10 years now.
- While the government intends to prohibit or restrict industrial and developmental activities in some 37% of the mountain range, the Western Ghats states are opposed to many such barriers.

What model should be adopted for protecting western ghats -

Preventive Approach: Considering the changes in climate, which would affect the livelihood of all people and hurt the nation's economy, it is prudent to conserve the fragile ecosystems.

This will cost less compared to the situation prone to calamities than spending money /resources for restoration / rejuvenation.

Thus, any further delay in the implementation will only accentuate degrading of the most prized natural resource of the country.

Engaging With All Stakeholders: A proper analysis based on scientific study followed by consensus among various stakeholders by addressing respective concerns is required urgently.

Holistic view of threats and demands on the forest land, products and services, devising strategies to address these with clearly stated objectives for the authorities involved must be taken.

Addressing the Concerns of Local People: Arguments go that the idea of demarcating an ecologically sensitive area is inherently against people and their developmental aspirations.

However, many of the local people might have no information on what is an ESA; whether it will derail development in the region and what are the alternative models of development.

The issue can be discussed through detailed public consultations so that the policy is not seen to have a top-down approach.

Role of State Governments: The states must recognize the dangers of destroying the ecosystem, especially when India has been facing the brunt of the climate crisis.

They must realise that the climate crisis is a reality, and instead of delaying the decision-making process, devise more decisive climate-proofing actions to save the valuable Western Ghats.

Empowering Local Communities: The WGEEP emphasised that it is the people at the grassroot level who have the knowledge and are tied to the environment should have the motivation to safeguard the region.

The way forward lies in the pursuit of genuine democratic decentralisation and empowering local communities in villages and cities.

The people of Western have previously pioneered progressive initiatives such as the People's Planning Campaign in Kerala. The spirit of such movements should now be restored to effectively counter resource exhaustion.

Conclusion

There are no two views on protecting the Western Ghats, but also, there is a need to strike a balance between safeguarding the forests and the right to livelihood of the local people. It is important to realise that the Western Ghats or any natural resource for that matter, is not just ours to destroy. It is everyone's duty to preserve it for posterity.

27. In your opinion, are the ongoing global efforts to address the threats posed by climate change adequate? Critically comment.

Approach

Candidates can start with reference or giving definition of the climate change and then simply highlight some global efforts also mention how it is falling short with examples and proper substantiation in the end provide a wayforward or ideas to mitigate threats.

Introduction

Climate Change is a periodic modification of Earth's climate brought about due to the changes in the atmosphere as well as the interactions between the atmosphere and various other geological, chemical, biological and geographical factors within the Earth's system.

Body

- Climate change includes both global warming driven by human-induced emissions of greenhouse gases and the resulting large-scale shifts in weather patterns.

- Though there have been previous periods of climatic change, since the mid-20th century humans have had an unprecedented impact on Earth's climate system and caused change on a global scale.

Effects of climate change:

- Global warming has caused a change in the climatic and weather conditions like change in the rainfall pattern, increased flooding, drought, heatwaves, etc.
- The planet's ocean and glaciers have felt some significant changes. Oceans are currently warming and becoming more acidic. The ice caps are melting, causing the sea levels to rise.
- These changes are predicted to be more prominent in the coming decades, threatening our environment and existence.

Global efforts to address the threats:

- United Nations Framework Convention on Climate Change (UNFCCC): The ultimate aim of the Convention is to stabilize the greenhouse gas concentration "at a level that would prevent dangerous anthropogenic interference with the climate system".
- It also aims to achieve the said level within a specific period so that the ecosystem is allowed to adapt naturally to climate change while also ensuring food security and sustainable economic development.
- Intergovernmental Panel on Climate Change (IPCC): It provides the policymakers with regular scientific assessments on climate change, its implications and potential future risks while also providing adaptation and mitigation options.
- Blue Carbon Initiative is an international cooperation between Conservation International (CI), IUCN and the Intergovernmental Oceanic Commission (IOC) of UNESCO focused on mitigating climate change through the conservation and restoration of coastal marine ecosystems.
- REDD+: The REDD+ goes beyond simply deforestation and forest degradation by including the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.
- Glasgow Breakthrough Agenda: This is a cooperative effort to accelerate the development and deployment of clean technologies and sustainable solutions in areas such as clean power, road transport, steel and hydrogen.
- Global Climate Change Alliance (GCCA) is a European Union Initiative which helps mainly Small Islands Developing States (SIDS) and Least Developed Countries (LDCs) increase their resilience to climate change.

Is the world doing enough to tackle global warming?

- To slow the process of global warming by limiting a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to

pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.

- Oxfam said that the 'net zero' carbon targets that many countries have been announcing may be a "dangerous distraction" from the priority of cutting carbon emissions. Oxfam said that the world needs to collectively be on track and should aim to cut emissions by 45 percent by 2030 from 2010 levels.
- The Paris Agreement requires that all countries — rich, poor, developed, and developing — slash greenhouse gas emissions. Nations voluntarily set their emissions targets and incur no penalties for falling short of their targets.
- To prevent warming beyond 1.5°C, we need to reduce emissions by 7.6% every year from this year to 2030. (EGR, 2019)
- 10 years ago, if countries had acted on this science, governments would have needed to reduce emissions by 3.3% each year. Every year we fail to act, the level of difficulty and cost to reduce emissions goes up. (EGR, 2019)

Conclusion

Increased commitments can take many forms but overall they must serve to shift countries and economies onto a path of decarbonization, setting targets for net-zero carbon, and timelines of how to reach that target, most typically through a rapid acceleration of energy sourced from renewables and rapid deceleration of fossil fuel dependency.

28. Describe the factors that contribute to sea level rise. Describe the potential ecological disruptions caused by sea level rise.

Approach

Candidates can start with reference to Sea level rise phenomenon and then highlight the how much it is major concern and also write about the different factors responsible for sea level rise also highlight threats ecological disruption caused by it. Can give special reference to the India.

Introduction

Global sea level has been rising over the past century, and the rate has accelerated in recent decades. The average global sea level has risen 8.9 inches between 1880 and 2015. That's much faster than in the previous 2,700 years. SLR is not uniform across the world.

Body

- SLR is not uniform across the world. Regional SLR may be higher or lower than Global SLR due to subsidence, upstream flood control, erosion, regional ocean currents, variations in land height, and compressive weight of Ice Age glaciers.

Sea Level Rise a Major Concern:

- Sea level rise will continue after emissions no longer increase, because oceans respond slowly to warming.
- The centennial-scale irreversibility of sea-level rise has implications for the future even under the low emissions scenarios.
- Sea level rise occurs mainly due to the expansion of warm ocean waters, the melting of glaciers on land, and the melting of ice sheets in Greenland and Antarctica.
- Projections based on structured expert judgments indicate that sea-level rise as high as 2.3m by 2100 cannot be ruled out.
- According to the UN Environment Programme Emissions Gap Report, the world is heading for a temperature rise above 3°C this century (double the Paris Agreement aspiration). And there is deep uncertainty in sea-level projections for warming above 3°C.
- Understanding the risks involved from climate change and sea-level rise in the 21st and 22nd centuries is crucial.
- Earlier, IPCC released 'The Special Report on the Ocean and Cryosphere in a Changing Climate' which underlined the dire changes taking place in oceans, glaciers, and ice-deposits on land and sea. The report expects oceans to rise between 10 and 30 inches by 2100 with temperatures warming 1.5 °C.

SLR is Linked to Three Primary Factors:
- Thermal Expansion: When water heats up, it expands. About half of the sea-level rise over the past 25 years is attributable to warmer oceans simply occupying more space.
- Melting Glaciers: Higher temperatures caused by global warming have led to greater-than-average summer melting of large ice formations like mountain glaciers as well as diminished snowfall due to later winters and earlier springs.
- That creates an imbalance between runoff and ocean evaporation, causing sea levels to rise.
- Loss of Greenland and Antarctic Ice Sheets: As with mountain glaciers, increased heat is causing the massive ice sheets that cover Greenland and Antarctica to melt more quickly, and also move more quickly into the sea.

Potential ecological threats:

- Coastal Flooding: Globally, eight of the world's 10 largest cities are near a coast, which is threatened by coastal flooding. Jakarta (Indonesia) is being known as the world's fastest-sinking city, by about 25 cm into the ground

every year. Other cities that regularly feature in the lists endangered by climate change include Guangzhou, Jakarta, Miami, Mumbai and Manila.

- Destruction of Coastal Biodiversity: SLR can cause destructive erosion, wetland flooding, aquifer and agricultural soil contamination with salt, and lost habitat for biodiversity.
- Dangerous Storm Surges: Higher sea levels are coinciding with more dangerous hurricanes and typhoons leading to loss of life and property.
- Lateral and Inland Migration: Flooding in low-lying coastal areas is forcing people to migrate to the higher ground causing displacement and dispossession and in turn a refugee crisis worldwide.
- Effect on Communications Infrastructure: The prospect of higher coastal water levels threatens basic services such as internet access.
- Threat to Inland Life: Rising seas can contaminate soil and groundwater with salt threatening life farther away from coasts.
- Tourism and Military Preparedness: Tourism to coastal areas and military preparedness will also be negatively affected by an increase in SLR.

Vulnerability in India:

- Communities along the coast in India are vulnerable to sea-level rise and storms.
- With climate change, storms will become more intense and frequent. They will be accompanied by storm surges, heavy rain and flooding.
- Even the 0.1m to 0.2m rise expected along India in the next few decades can cause frequent coastal flooding.

Way forward

- Building Sea Wall: Indonesia's government launched a coastal development project called a Giant Sea Wall or "Giant Garuda" in 2014 meant to protect the city from floods.
- Architecture to Steer Flow of Water: Dutch City Rotterdam built barriers, drainage, and innovative architectural features such as a "water square" with temporary ponds.
- Relocation: Many coastal cities have planned to adopt relocation as a mitigation strategy. For example, Kiribati Island has planned to shift to Fiji, while the Capital of Indonesia is being relocated from Jakarta to Borneo.
- Switching from fossil fuels to clean alternatives like solar and wind energy.
- Instituting carbon taxes on industries and subsidies for reducing the carbon footprint.
- Carbon sequestration by geo-engineering and natural methods like restoring peatland and wetland areas to capture existing greenhouse gases.
- Afforestation and reducing deforestation.
- Subsidizing research on climate change.

29. What are methods of environmental impact assessment? How is it different from cost benefit analysis? Explain with the help of suitable examples.

Approach

Candidate can define various methods of EIA along with the appropriate examples. In the second part, cost benefit analysis can be given with examples while showcasing the differences between the two processes.

Introduction

Environmental Impact Assessment (EIA) is a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers.

Body

Environment impact assessment process

Environment Impact Assessment (EIA) process can vary depending on a country's policy and requirement. However, EIA process in most countries, including India, have the following steps:

- Screening
- Scoping
- Collection of baseline data
- Impact Prediction
- Assessment of alternatives, mitigation measures & Environmental, Impact Assessment Report
- Public Hearing
- Decision Making
- Monitoring the clearance conditions

Screening: This is the first step in the EIA process. At this stage it is decided whether the proposed project needs an EIA and if so to what detail. Screening criteria are based upon:

- Scales of investment
- Type of development
- Location of development

Scoping: It is the most significant step in the entire EIA process as key environmental issues involved are identified at this stage.

- Scoping has to be done by consultants in consultation with the project proponent and guidance, if needed, from Impact Assessment Agency
- The Ministry of Environment and Forests has published sector-wise guidelines which outline the significant issues which have to be addressed while conducting the EIA studies.
- At the end of scoping, detailed terms of reference (TOR) are prepared of EIA.
- TOR is a written document containing written requirements governing EIA implementation, consultations to be held, data to be gathered, methodology to be used etc

Collection of baseline data: It describes the existing environmental status of the identified study area. The site-specific primary data is monitored and supplemented with secondary data

Impact prediction: Under this, possible effects on the physical, biological, social and economic conditions are taken into consideration and measures are suggested to prevent, reduce or compensate for the impacts.
For example:

- Impact of biological diversity in an area ex. EIA done by Gadgil panel on the western ghats regions.
- Impact on habitat because of deforestation and pollution- Impact on Himalayan ecosystem when hydropower projects are opened.

Assessment of alternatives, mitigation measures & Environmental Impact Assessment Report: Identification of alternatives and their comparison: For every project, possible alternatives are to be identified and environmental impacts and benefits to be compared.
Alternatives should then be ranked for selection of the best environmental option for optimum economic benefits to the community at large.

Environment Management Plan (EMP): Once alternatives have been reviewed, an impact mitigation plan is drawn up for the selected option and is supplemented with an Environmental Management Plan (EMP) to guide the proponent towards environmental improvements.

Public Hearing: Public must be informed and consulted on a proposed development after the completion of EIA report
Gram Sabha must be consulted before the project starts. Gram Sabha means the electorate (people eligible to vote) of the region

Decision making: It involves consultations between the project proponent (assisted by a consultant) and the impact assessment authority (assisted by an expert group if necessary). Final decision regarding the project is taken, keeping in mind EIA and EMP (Environment Management Plan).

Monitoring: Monitoring should be done during both construction and operation phases of a project. This is not only to ensure that the commitments made are complied with but also to observe whether the predictions made in the EIA reports were correct or not.

Cost benefit analysis

- Environmental cost-benefit analysis (CBA) is the application of CBA to projects or policies that have the deliberate aim of environmental improvement or actions that somehow affect the natural environment as an indirect consequence.
- The systematic process of calculating the benefits and costs of policy options and projects is now widely regarded as an essential step in the policy process.
- It helps decision makers to have a clear picture of how society would fare under a range of policy options for achieving particular goals.
- For example, Imagine a choice between energy project options which involve investing in a coal-fi red power plant or a renewable energy investment, such as in wind turbines. In choosing between these options (or deciding not to invest in either), one analytical tool that decision-makers and practitioners might use is cost-benefit analysis (CBA).
- This requires understanding what these options provide in terms of benefits (defined as increases in human well-being) and costs (defined as reductions in human well-being). Although it sounds simple enough, some way must be found to aggregate environmental and social benefits and costs across different people (within a given geographical boundary) and finding some means of monetising these, accounting for different points in time when the impacts occur.

Conclusion

In a world that is challenged by environmental degradation and social conflicts, scholars have upheld public and local participation to be a "threshold condition" for development. EIA provides this necessary element in the economic development process. Therefore, EIA-based approvals for most projects should mandatorily and necessarily involve the process of conducting public hearings so that the views and opinions of people who are likely to be affected can be taken on board.

30. Analyse the factors that make hilly regions vulnerable to natural disasters to natural disasters, is there a need to modify disaster mitigation strategies based on hill ecosystems. Discuss.

Approach

A simple straightforward question where candidates need to explain about what factors are making hilly regions vulnerable to natural disasters ,in second part of answer write about how modification of disaster mitigation strategies will help to solve the problem .

Introduction

A disaster is a result of natural or man-made causes that leads to sudden disruption of normal life, causing severe damage to life and property to an extent that available social and economic protection mechanisms are inadequate to cope. It is an undesirable occurrence resulting from forces that are largely outside human control. Hilly regions in recent times making headlines for frequent disasters. hence there is need to modify disaster mitigation strategies .

Body

In mountainous areas, due to the unique geological and topographical conditions, and along with the impact of global climate change, extreme rainfall events often occur and induce natural disasters such as flash floods, debris flows, landslides, dammed lakes and others.

Factors that make hilly region more vulnerable

- **Environmental degradation**- Removal of trees and forest cover from a watershed area have caused, soil erosion, expansion of flood plain area in upper and middle course of rivers and groundwater depletion.
- **Developmental process**- Exploitation of land use, development of infrastructure, rapid urbanization and technological development have caused increasing pressure over the natural resources.
- **Political issues**- War, nuclear power aspirations, fight between countries to become super power and conquering land, sea and skies. These have resulted into wide range of disaster events such as Hiroshima nuclear explosion, Syrian civil war, growing militarisation of oceans and outer space.
- **Industrialization**- This has resulted into warming of earth and frequency of extreme weather events has also increased.
- **Natural topography**-Landslides are very common in the Lower Himalayas. The young age of the region's hills results in rock formations, which are susceptible to slippages. Rising population and development pressures, particularly from logging and tourism, cause deforestation. The result is denuded hillsides which exacerbate the severity of landslides; since tree, cover impedes the downhill

flow of water.Parts of the Western Ghats also suffer from low-intensity landslides. Avalanches occurrences are common in Kashmir, Himachal Pradesh, and Sikkim etc. Landslides in India are also highly dangerous as many Indian families and farmers reside in the hills or mountains

Stages in Disaster Management-

- Disaster Management efforts are geared towards disaster risk management.
- Disaster Risk Management implies the systematic process of using administrative decisions, organisation, operational skills, and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impact of natural hazards and related environmental and technological disasters.
- These comprise all forms all activities including structural and non- structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.
- There are three key stages of activities in disaster management:
- Before a disaster: to reduce the potential for human, material, or environmental losses caused by hazards and to ensure that these losses are ministered when disaster strikes;
- During a disaster: to ensure that the needs and provisions of victims are met to alleviate and minimise suffering; and
- After a disaster: to achieve rapid and durable recovery which does not reproduce the original vulnerable conditions.
- The different phases of disaster management are represented in the disaster cycle diagram.

Disaster Risk Reduction (DRR)-

- Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and reduce the causal factors of disasters.
- Pre-Disaster risk reduction includes-
- Mitigation: To eliminate or reduce the impacts and risks of hazards through proactive measures taken before an emergency or disaster occurs.
- Preparedness: To take steps to prepare and reduce the effects of disasters.
- Post-Disaster risk reduction includes-
- Rescue: Providing warning, evacuation, search, rescue, providing immediate assistance.
- Relief: To respond to communities who become victims of disaster, providing relief measures such as food packets, water, medicines, temporary accommodation, relief camps etc.
- Recovery: This stage emphasizes upon recovery of victims of disaster, recovery of damaged infrastructure and repair of the damages caused.

Conclusion

Due to the unique geological and topographical conditions, and along with the impact of global climate change, extreme rainfall events often occur and induce natural disasters such as flash floods, debris flows, landslides, dammed lakes and others. Hence there is frequent phenomenon of natural disasters in hilly regions now a days .modified mitigation strategies can help to reduce the impact disasters.

31. Examine the changing threat perception of left wing extremism [LWE] in India , do you think LWE has been losing its social base in recent years ?critically comment

Approach

A simple straightforward question where candidates need to write about how left wing extremism is losing ground and social base in India. In second part of answer, write about how over the time threat perception regarding LWE is changing in recent times.

Introduction

According to data provided by the Ministry of Home Affairs (MHA), there has been a steady decline in Left Wing Extremism (LWE) related violence and geographical spread of LWE influence in the country. The geographical influence of Maoists has contracted to only 41 districts in the country, which is a sharp reduction from 96 such districts in 10 States in 2010.LWE incidents have also reduced from 2,258 in 2009 to 349 incidents till August 2021.

Body

The left-wing extremism (LWE) or Naxal insurgency in India originated in a 1967 uprising in Naxalbari, West Bengal by the Communist Party of India (Marxist). They are the group of people who believe in the political theory derived from the teachings of the Chinese political leader Mao Zedong. The Naxals strongly believe that the solution to social and economic discrimination is to overthrow the existing political system.

- The term Naxalism derives its name from the village Naxalbari of West Bengal. It originated as a rebellion against local landlords who bashed a peasant over a land dispute.
- The rebellion was started with objective of rightful redistribution of the land to working peasants under the leadership of Kanu Sanyal and Jagan Santhal.
- The movement has spread across the Eastern India in less developed areas of states such as Chhattisgarh, Odisha and Andhra Pradesh.

- It is considered that Naxals support Maoist political sentiments and ideology.
- Maoism is a form of communism developed by Mao Tse Tung. It is a doctrine to capture State power through a combination of armed insurgency, mass mobilization and strategic alliances.
- The region, affected by LWE, is referred to as the Red corridor.

Reasons for the LWE:

Tribal Discontent:
- The Forest (Conservation) Act, 1980 has been used to target tribals, who depend on forest produce for their living.
- Massive displacement of tribal population in the naxalism-affected states due to development projects, mining operations and other reasons.

Easy Target for Maoists:

- Such people who do not have any source of living are taken into naxalism by Maoists.
- Maoists provide arms and ammunition and money to such people.
- Gaps in the Socio-Economic System of the Country:
- Government measures its success on the basis of the number of violent attacks rather than the development done in the naxal-affected areas.
- Absence of strong technical intelligence to fight with naxalites.
- Infrastructural problems, for instance, some villages are not yet connected properly with any communication network.
- No Follow-Up from Administration:
- It is seen that even after police take hold of a region, administration fails to provide essential services to the people of that region.
- Confusion over tackling naxalism as a social issue or as a security threat.

Governments Initiatives to Check Naxal Activities:

Aspirational Districts Programme: Launched in 2018, it aims to rapidly transform the districts that have shown relatively lesser progress in key social areas.
SAMADHAN (2017):
It stands for
- S- Smart Leadership,
- A- Aggressive Strategy,
- M- Motivation and Training,
- A- Actionable Intelligence,
- D- Dashboard Based KPIs (Key Performance Indicators) and KRAs (Key Result Areas),
- H- Harnessing Technology,
- A- Action plan for each Theatre, and
- N- No access to Financing.

- This doctrine is the one-stop solution for the LWE problem. It encompasses the entire strategy of government from short-term policy to long-term policy formulated at different levels.
- National Policy and Action Plan in 2015: It consists of a multi-pronged approach comprising security measures, development initiatives and ensuring rights & entitlements of local communities.
- The Ministry of Home Affairs (MHA) is supporting the State Governments extensively by way of deployment of Central Armed Police Force (CAPF) Battalions, provision of helicopters and UAVs and sanction of India Reserve Battalions (IRBs)/ Special India Reserve Battalions (SIRBs) etc.
- Funds are provided under Modernization of Police Force (MPF), Security Related Expenditure (SRE) Scheme and Special Infrastructure Scheme (SIS) for modernization and training of State Police.
- Several development initiatives have been implemented for construction of roads, installation of mobile towers, skill development, improving network of banks and post offices, health and education facilities.
- Funds for development are also provided to most LWE affected districts under the Special Central Assistance (SCA) scheme.
- Greyhounds: It was raised in 1989 as an elite anti-naxal force.
- Operation Green Hunt: It was started in 2009-10 and massive deployment of security forces was done in the naxal-affected areas.-

Way Forward

Though the number of incidents of LWE violence has come down in the recent past, continued efforts and focus are needed in eliminating such groups.Innovative measures are required to be employed in preventing IED (Improvised Explosive Device) related incidents which have caused significant casualties in recent years. States should rationalize their surrender policy in order to bring innocent individuals caught in the trap of LWE into the mainstream.

Conclusion

Through a holistic approach focusing on development and security-related interventions, the LWE problem can be successfully tackled. Government schemes such as SAMADHAN acted as game changer in tackling let wing issue but Civil society and the media should continue to build pressure on the Maoists to give up on violence and join the mainstream.

32. How do you feel about the debate over granting asylum to communities persecuted in neighboring countries? Are you concerned that allowing refugees into India might threaten its internal security? Substantiate your views.

Approach

Candidates can start with reference asylum seeker or refugee and then explain the issues and debate around allowing them to stay in India explain with neighbourhood nation perspective and then also highlight some internal security threats.

Introduction

An asylum-seeker is a person who has left their country and is seeking protection from persecution and serious human rights violations in another country. However, he/she hasn't yet been legally recognized as a refugee and is waiting to receive a decision on their asylum claim. Seeking asylum is a human right.

Body

India faced a huge influx of refugees-asylum seeker at various points in history. More details on the occasions are listed below:

- A refugee is a person who has fled their own country because they are at risk of serious human rights violations and persecution there.
- Partition of India and Pakistan in 1947: The scale of the problem was unprecedented to the newly formed Government of India. The city of Faridabad had to be rebuilt to rehabilitate the refugees. Social reformers like Kamaldevi Chattopadhyay and many others played an important role in the rehabilitation of refugees.
- Tibetan Refugees in 1959: Dalai Lama and his 1 lakh followers were granted asylum in India when they were persecuted by Chinese authorities.
- Bangladesh War: This crisis happened in 1971 when million migrated to India to flee the conflict in Bangladesh
- Sri Lankan Civil War: It resulted in the migration of huge numbers of refugees from Sri Lanka who settled in Tamil Nadu.
- Afghan Refugees: As per UNHCR report more than 2,00,000 Afghan refugees are living in India.
- Rohingya Refugees: The recent conflict in Myanmar resulted in a huge influx of Rohingya refugees in India.

Debate our asylums and refugees and laws:

- Much of the debate in India is about illegal immigrants, not refugees, the two categories tend to get bunched together.

- Refugees' vs Immigrants: In the recent past, many people from neighbouring countries tend to illegally immigrate to India, not because of state persecution but in search of better economic opportunities in India.
- While the reality is that much of the debate in the country is about illegal immigrants, not refugees, the two categories tend to get bunched together.
- Our policies towards illegal immigrants and refugees is confused is because as per Indian law, both categories of people are viewed as one and the same and are covered under the Foreigners Act, 1946.
- The absence of legal framework for refugees leads to policy ambiguity whereby India's refugee policy is guided primarily by ad hocism and 'political utility'.
- At the same time, the absence of a legal framework increases the possibility of the domestic politicisation of refugee protection and complicates its geopolitical faultlines.

Internal security threat due to refugees from neighbourhood countries:

- Refugees might create an identity crisis with the indigenous people. For example, Bangladeshi refugees in Assam and Arunachal threaten to overtake the indigenous population of the region.
- Difficult to identify and deport them back to their country after a few years. For example, the Rohingya refugees entered through the North-East. But later they spread to all other states. But later they spread to all other states, like Haryana, Kerala, Telangana and UTs like Jammu and Kashmir, Delhi, etc. Identifying them among more than a billion Indians is a great challenge.
- Issue of terrorism: These refugees, since not accepted by governments, are vulnerable to join terror outfits for work and revenue.
- Issue of illegal voting: The illegal migrants to avail the benefits, procure illegal national identity cards such as voter id. By procuring that, they also vote in elections and influence the outcome.
- Decreases wage level and replace the native people: Since illegal immigrants and refugees require food and shelter, they also work at very low wages in their settling areas. It impacts the lives of locals, as they don't get adequate jobs.

Wayforward

- India should encourage the State governments to carry out the NRC (National Register of Citizens) and identify the number of refugees and illegal immigrants.
- The Central Government should appoint a National Immigration Commission to frame a National Migration Policy and a National Refugee Policy for India.
- The government have to strengthen the Foreigners Act 1946 and also sign bilateral agreements with neighbourhood countries regarding deportation.
- Strengthening the borders: India also needs to strengthen the border areas as the borders are porous and the neighbourhood countries are facing political

vulnerabilities constantly. India can improve border surveillance, exploring the options of border fencing and smart walls, etc.

33. Do a critical assessment of the effects of abrogating Article 370 on militant activities in the Kashmir valley.

Approach

Candidates can start with reference to article 370 and its special temporary status and why it was scraped. In body part assess with emphasise on how it was positively paved the way for the development with reduction in threat perception and terrorism due to diplomatic and security apparatus also provide information alternative argument on its increased intrusion, killings by terrorists and its negative impact.

Introduction

Article 370 of the Indian constitution was an article that gave autonomous status to the state of Jammu and Kashmir. While the article was created to give temporary, transitional, special provisions to Jammu and Kashmir, GoI repealed Article 370 in 2019 it had several economic, political and security wise impact let us analyse it.

Body

Change in threat perception due to positive impact of abrogation on Article 370:
- Reduced covert attacks: There have been fewer improvised explosive devices (IEDs) and grenade attacks in past two years.
- State police: Also due to designation as union territory the state's police will not be answerable to Kashmir-based politicians. Rather, the police will answer to the center.
- Intelligence: National Intelligence had strengthened against terrorism through better presence in the valley. However, it will take some time to do more.
- Terrorism: Government in parliament said there has been a 33 per cent drop in infiltration in 2021, 90 per cent decrease in ceasefire violations, 61 per cent decline in terrorism related incidents, and 80 per cent fall in abductions by terrorists. According to the South Asia Terrorism Portal (SATP), the lockdown and increase in Army presence led to a decrease in terrorism-related deaths.
- Support from Gulf Countries: The Gulf countries, with which Pakistan has enjoyed a long standing "brotherly" relationship for decades, have stayed away from condemning India's crackdown in Kashmir.
- Diplomatic win and perception game: India has mostly succeeded in conveying that it would brook no third-party mediation. India has been able to get its way mostly on this the nuclearisation of South Asia and the growing global interest in India's economy.

- Slow Normalisation setting in: as the shops are opening, schools have started and hospitals are working fine. Although people had grievance against the abrogation in the early days, but now many in regions have reconciled to this abrogation. Recently, the Confederation of Indian Industry (CII) has announced an industrial program in October.
- Democratic Processes: The recently concluded panchayat elections have been successful. It can be seen from the voting percentage, which has been around 98%. Even South Kashmir (Anantnag-94%), Jammu (99%) and Srinagar (100%) has witnessed good voting.
- Dividing Ladakh from J&K has not only fulfilled the demands of the people of the region but also has sent a clear message to China that it is an integral part of India where Indian constitution holds despite China sometimes claiming it to be its own territory.

Although heavy presence of armed forces, absence of a democratically-elected state government and broadly non-Kashmiri administrative and police structure have created some peculiar situation:

- Border intrusion: Infiltration attempts along the LoC, however, remain high as Pakistan-based terrorist groups continue to try to send more militants in the Valley.
- Targeted killing: The killings of Rahul Bhat and Rajni Bala and Vijay Kumar in Kulgam—have added a new dimension to the ongoing round of attacks. A newborn organisation, The Resistance Front (TRF), has taken responsibility for these killings. The violence in Kashmir is not limited to the Kashmiri Pandits or Hindu migrant workers. Many Muslim citizens have also been killed.
- Public perception of the move: The abrogation of autonomy without the consent of the Kashmiris has raised the threat perception among the people regarding their identity and culture. The lost 'autonomy' and Art. 370 had a symbolic and emotional significance for Kashmir's people.
- Agriculture: Threats from militants, coupled with the government's severe clampdown delayed the harvest for over a month, dealing a crippling blow to the industry during the peak harvest season. The apple industry in Kashmir, worth INR 80 billion which contributes 8 per cent of J&K's GDP, has been worst affected.
- China in Finger 8: Visibly after abrogation, we have witnessed the increased cases of transgression by the Chinese PLA in Ladakh.

Conclusion

The more democratic rights should be given to the people of J&K to reduce the trust deficit and to win over the confidence of the Kashmiris the more this is given the more they feel a part of the Indian Union. Now is the time to renew ties with the region by initiating a series of serious and sincere interlocution measures to win over the confidence of the alienated population.

34. Examine the challenge of drug abuse in India. Why is this problem particularly severe in some border states? Explain.

Approach

Candidate can discuss the extent of drug abuse in India while highlighting the reasons behind it. In the second part, reasons behind prevalence of drug menace in border states can be given along with a way forward.

Introduction

Drug menace is a global problem. Drug abuse refers to the habit of regular intake of illegal drugs characterized by misuse of drugs. There is a thin line of difference between Drug abuse and addiction. In the case of drug abuse, the person may or may not be addicted to these harmful drugs. However, in the case of drug addiction, the person is severely addicted to these drugs. Thus, drug abuse may often lead to drug addiction.

Body

Drug abuse in India

- According to a report by the United Nation Office on Drugs and Crime (UNODC), India is one of the major hubs of illicit drug trade ranging from age-old cannabis to newer prescription drugs like tramadol, and designer drugs like methamphetamine.
- The money from the drug trade is used to finance terrorism, human trafficking, illegal businesses etc.
- In order to find the prevalence of drug abuse in India, a study was conducted by the Ministry of Social Justice and Empowerment (MoSJE). As per the 2019 report, 14.6% of the population uses alcohol. It is higher among men than women. It was found that 2.8% of the population uses Cannabis.
- According to the NCRB report, some of the drugs are Ganja, Methaqualone, Ephedrine/Pseudo Ephedrine, Hashish and Heroin. Apart from these, the abuse of pharmaceutical drugs is also on the rise.
- India is situated between two important drug supply centres: Golden Crescent (Iran, Afghanistan and Pakistan) and the Golden Triangle (Myanmar, Thailand, Laos and Myanmar). Because of this, India has always been in transit as well as gradually a consumption point. So it is difficult to say that drug abuse has come down in India.
- Drug abuse is one of the most serious health problems faced by the world today which not only destroys the person involved, but his entire family, the society and the nation at large & spawns antisocial behaviour such as stealing, crime and violence.
- Drug abuse adversely affects the economic growth of a country by generating un-accounted money in large quantity that are also often used to fund terror

and anti national activities and therefore posing a serious threat to the national security too.

- In 1987 the United Nations decided to observe June 26th as 'International Day against Drug Abuse and Illicit trafficking', to sensitize the people in general and the youth in particular, to the menace of drugs.

Reasons behind severity of problem in border region

- Presence of Golden crescent and triangle in the neighbourhood.
- Siphoning of drugs in the market even by the officials.
- Porous border and trafficking, illegal migrants.
- A large amount of black money in the market also helps in flourishing illegal businesses.
- The 'dark net' trend, although illegal, had raised concerns of attracting a new population of drug users as it avoids direct contact with criminals and law-enforcing authorities.
- Jobless growth and prevalence of unemployment.
- No proper implementation of laws.
- Corruption

Why is it a serious security problem?

- Drugs smuggled from across the border poses a serious threat to India's internal security preparedness.
- The involvement of various terrorist groups and syndicates in drug trafficking leads to threats to the national security and sovereignty of states by the way of narco-terrorism.
- Provide finance for the terror activities in the country.
- Same links and sources can also be used for smuggling arms and creating terror in the area.
- Youth once engulfed into drugs are more vulnerable towards committing crimes for a small amount of money to afford drugs.
- It is considered to be the originator of petty offences as well as heinous crimes like smuggling of arms and ammunition and money laundering.
- Threat to the nation as it involves usage and generation of black money.

What can be done?

- Secured Border: Increased security on border areas and fencing to ensure that drugs don't enter India.
- International Collaboration: Need to effectively use SAARC and ASEAN platform for joint coordinated action against drugs trafficking.
- Govt. Vigilantism: The Anti-Narcotic Squads and Drug Enforcement Agencies should be more vigilant in controlling drug trafficking.
- Legal Measures: The Narcotic Drugs and Psychotropic Substances Act, 1985, should be enacted with stringent provisions to curb this menace. However,

effective implementation and time-bound judicial process are the need of the hour.

- Awareness Campaigns: Anti-drug consumption campaign could be launched. NCB in collaboration with state agencies and concerned ministries should organize awareness campaigns.
- Role of Media: Mass media should play an important role in spreading awareness about the menace of drug abuse and not glorifying drug abuse.
- Role of NGOs: Govt. should fund more NGOs to work in this field.
- De-addiction centres: Make necessary and sufficient counselling and rehabilitation centres with required resources and trained health workers.

Conclusion

Addiction should not be seen as a character flaw, but as an ailment that any other person could be struggling with. Therefore, the stigma associated with drug taking needs to be reduced. Society needs to understand that drug-addicts are victims and not criminals.

35. The threat to India's internal security emanating from the Northeast has subsided to a large extent in the last decade. Do you agree? Critically examine.

Approach

Candidate can briefly highlight the challenges emanating from north east with respect to internal security. A brief review of last decade can be stated along with the way ahead to reduce secessionist tendencies.

Introduction

North East India is the region situated in the eastern-most part of India comprising of the eight states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. It is linked with Indian heartland through the 21 km. wide Siliguri Corridor, which is commonly known as the chicken neck, created by the Radcliffe line. The corridor is flanked by Bhutan, Bangladesh and Nepal.

Body

Challenges from north east to India's internal security

- National conflicts: Involving concept of a distinct 'homeland' as a separate nation and pursuit of the realization of that goal by use of various methods both violent as well as non violent. For instance, ULFA demand for sovereign Asom, NSCN for Greater Nagaland.
- Ethnic conflicts: Involving assertion of numerically smaller and less dominant tribal groups against the political and cultural hold of the dominant tribal

group. In Assam this also takes the form of tension between local and migrant communities.

- Sub-regional conflicts: Involving movements which ask for recognition of sub-regional aspirations and often come in direct conflict with the State Governments or even the autonomous Councils. For instance, United People's Democratic Solidarity (UPDS) in Assam.

Current state of north east

- The state response has effectively curbed violence in North-east in past decade. Removal of AFSPA from several states is indicator of the reduced rate of violence in the region.
- The political nexus have helped them carry out their illicit works. In return, run extortion rackets and all types of other illegal trades and get right to operate within limits with impunity.
- This results in dismal law and order situation in these areas. It is this absence of rule of law that these groups are still operating. Chances of a political settlement are bleak because of the kind of diversity it holds.
- Recent engagement with the insurgent groups, ceasefire agreements, talks with naga groups have resulted in less violence in last decade.
- While the government's military options have achieved only minimal results, lack of development continues to alienate the people of the region further from the mainstream.
- The region has also received little attention from either the national or the international media. Achievements by a separate ministry created by the Indian government for the development of the region remain minimal.
- The ceasefire agreements and peace negotiations have resulted in reducing the violence levels and given the civil societies of the region space to talk.

What can be done to reduce secessionist tendencies?

- It is important to understand the culture and psyche of the people of North East while framing policy alternatives.
- Security situation in the region has improved considerably in Assam and Meghalaya in particular facilitating conducive atmosphere for investment and development. The Northeast Industrial Policy initiated by the Government of India further contributed in encouraging investment and industries in the region.
- The North East Council (NEC) and the Ministry for the Development of the North East Region (DoNER) have become fund disbursing agencies instead of strategic planning agencies. At present approximately Rs. 11,000 crore is lying idle with the Ministry of DoNER.
- When development comes to a region then it becomes a panacea for the secessonist movement. For instance, the Khalistan movement in Punjab was active in the 1980s and the 1990s, but is now largely subdued within India.

- Integrated and bottoms up approaches are required for integration of the North east in the Look East Policy which will immensely yield benefits in terms of development. The North East should formulate plans as to how it can engage with the ASEAN. Better coordination of efforts by all the Northeastern states should be ensured.

Conclusion

The ceasefire agreements have led to a reduction in the militancy-related fatalities in their respective states, a road map toward a situation of a permanent agreement is desired from central government. It will develop a conducive environment for investments in the region and will solve the socio-economic backwardness of the region.

36. Platforms like twitter and Facebook have become platforms for spreading Communal violence and hate .is it possible to resolve this problem solely through legal measures, Critically examine.

Approach

In this question candidates need to write about how social networking sites like Facebook and twitter become platforms for spreading communal violence and hate, in second part of answer write about can legal measures against it can be helpful for tackling this issue. Examine this critically.

Introduction

The phenomenal rise of Social Media (SM) platforms such as Facebook, Twitter and others is proving to be a double-edged sword in the functioning of democracies. On the one hand, it has democratised access to information but on the other hand, it has also posed new challenges which are now directly impacting our democracies and the people. however hate speech and rumour creating violence in society so resolving this problem is need of hour

Body

Fake news has existed since the dawn of the printing press but in the age of internet and social media, it has found a tremendous application. Manipulation of algorithms of social media and search engines—to reach large audiences and mislead news consumers is a global trend now.

- Censorship on a platform that advocates diversity of people, perspectives, ideas, and information faced criticism over the internet. The practice is considered undemocratic, hindering freedom of speech. With the backdrop of Jack's resignation, let us find out how social media is impacting political discourse.

- **Social Media and Politics**-The communication happening through social media has significant political bearings in democracies like India. When traditional media is thought to have surrendered before the ruling government, social media emerged as a platform that enabled the public to voice their opinion.
- In a way, social media gave the public the power that they never had before. They could hold authorities accountable, report injustice, and support the cause they believed in, through social media.
- **Social Media Became a Primary Source of News**-Two decades back, newspapers, television or radio were the primary mediums to fill us in with information. The authenticity of the news is crucial for these channels because it affects readership, viewership and the number of listeners. But today, our day starts with scrolling through social media on our phones. It has evolved into the most extensively used source of information, validation and knowledge for many of us. Social media sometimes outruns media houses too.
- **Confirmation Bias**-Social media algorithms and search engines observe users' behaviour and present relevant and engaging content. These are advertising tools to generate better revenue. They end up reinforcing the confirmation bias of the people who cling to their deeply held beliefs inside a filter bubble. Isolation from other perspectives makes people vulnerable to polarisation affecting political outcomes.
- The need to authenticate the news gets lost in the overwhelming pool of news because of cognitive bias. The brain stops processing information effectively due to overload, and people tend to share content that is low on credibility and quality.
- **Misinformation and Manipulation**-Social Media has reached every nook and corner of the world, basically to wherever a mobile internet connection is accessible. The easy use of social media has transformed the way humans now communicate and connect.
- Universal and easy accessibility of social media makes it a carrier of misinformation and manipulation that can spread rapidly. The anonymity creates low accountability and lets users spread misinformation without any real consequences.
- Microsoft study found that over 64% of Indians encounter fake news online, the highest reported amongst the 22 countries surveyed.There are a staggering number of edited images, manipulated videos and fake text messages spreading through social media platforms and messaging services like WhatsApp making it harder to distinguish between misinformation and credible facts.
- **Disinformation and Propaganda Politics**-Distortion of facts, using partial truths while changing the context to solve and manipulate a purpose, is disinformation. Increased disinformation on social media strengthens propaganda politics, gives rise to radicalism. The digital age is seeing an exponential increase in the usage of these tools to gain power. For example, reports were out in the media about personal data usage of the public to influence electoral outcomes.
- **Online Trolling**-Trolling is the new bi product of Social Media. Vigilantes take law in their own hand and start trolling and threatening those who don't agree with

their views or narratives. It has led to anonymous trolls who attack the reputation of an individual.

- **Women Safety-**Women face cyber rape and threats that affect their dignity severely. Sometimes their pictures and videos are leaked with and are forced to cyber bullying.

Countries across the world have already begun to acknowledge the issue of hate speech and fake news and how it affects the functioning of society. Germany and France have some of the most stringent policies in this regard.

- Democracies are full of diversity. Language, religion, culture, ethnicity, community are several distinguished factors attributed to this diversity. Diverse groups have different interests.
- They put pressure on the government to form policies favouring them. Policymakers always try to strike a balance between all these interest groups. Unauthenticated fake news circulated on social media propels society to lose its balance and disturbs communal harmony
- All these factors associated with the use of social media harm society and hamper the political system. Social media giants like Facebook, Twitter, Instagram are finding ways to regulate online content to stop these channels enabling jingoism or radicalism causing violence, bloodshed and fear in society. Also, authenticity and accountability of social media users is a must to protect democracy.
- Social media has direct implications for the political system. It can affect public mandate negatively but it can also help gather necessary support and momentum from people to bring real change on the ground and thus ensure good governance.
- It offers transparency, accountability, inclusiveness, makes democracy participatory and thus strengthens it. Using social media on several occasions has enhanced the efficacy and efficiency of leadership as well.
- Recently, the Government of India announced the New IT Rules for social media platforms in the 'Significant Social Media Intermediaries (SSMIs)' category.
- he Union government notified the 'The Information Technology (Guidelines for Intermediaries and Digital Media Ethics Code) Rules, 2021' in February 2021 and provided a three-month compliance window.
- The rules came in after a huge demand by people with regard to the harassment and other unlawful activities that take place on the social media platforms.
- The rules are aimed at substantially empowering the ordinary users of digital platforms by seeking redressal for their grievances and commanding accountability in case of infringement of their rights.
- The guidelines are framed to ensure social media remains a source of healthy information.
- Putting Accountability in Place: The social media platforms do not consider themselves liable if any objectionable content is shared. However, they often edit, promote and block content on their platforms.
- Considering the fact that some platforms even have about 50 crore Indian users and have their reach even in hinterlands.

- The guidelines, seeing from a positive aspect, will help in holding these platforms accountable for ensuring the prevention of any crime.
- There are indeed many problems with the new rules, but the major issue was that these were introduced without much public consultation.
- The solution to ongoing criticism about these rules is to start afresh with the publication of a white paper.

Conclusion

The purpose of social media is to support discussion and expression. Lack of accountability due to anonymity, technological manipulation for better revenue or propaganda compromise with the motive of social media. Leadership across the world and the people responsible for running social media should not let these platforms get reduced to a tool used by the powerful people for their own benefit. It should continue to give voice to the voiceless, or else it will lose its benign purpose.

37. How would you define cyberbullying? Are there any groups that are particularly vulnerable to this epidemic? Discuss.

Approach

Candidates can start with reference to what is cyberbullying and then provide some examples. Also try explain how particular group are affected by cyberbullying and then also give some measures to tackle this epidemic.

Introduction

Cyberbullying is bullying with the use of digital technologies. It can take place on social media, messaging platforms, gaming platforms and mobile phones. It is repeated behaviour, aimed at scaring, angering or shaming those who are targeted.

Body

Examples of cyberbullying include:

- Spreading lies about or posting embarrassing photos or videos of someone on social media
- Sending hurtful, abusive or threatening messages, images or videos via messaging platforms
- Impersonating someone and sending mean messages to others on their behalf or through fake accounts.
- Face-to-face bullying and cyberbullying can often happen alongside each other. But cyberbullying leaves a digital footprint a record that can prove useful and provide evidence to help stop the abuse.

Effects of cyber bullying:

- Sleep can be affected.
- Increasing tensions and anxiety.
- Appetite disturbances.
- Inability to concentrate on studies.
- Many students can become fearful of the school environment.

It's time to decode what Cyber Bullying is all about and who all it can impact:

- Woman: Recently, an open source app called BulliBai, hosted on the GitHub web platform, has become the headline for "women's auctions" from certain communities. Similarly, another Sulli Deals application has profiles of about 80 females, recently called them "Deals of the Day". Police in Mumbai and Delhi have recorded this incident.
- Girls: Girls are more likely than boys to be both victims and perpetrators of cyber bullying. 15% of teen girls have been the target of at least four different kinds of abusive online behaviors, compared with 6% of boys.
- Since the lockdown, be it the Instagram Bois Locker case in Delhi or the 10th class WhatsApp pornography group case from Bhagpat in UP, cyberbullying has become an even more serious Indian problem today.
- LGBTQ: About half of LGBTQ+ students experience online harassment a rate higher than average. Instagram is the social media site where most young people report experiencing cyberbullying, with 42% of those surveyed experiencing harassment on the platform.
- School kids: UNESCO Report Published in 2019 and drawing on data from 144 countries, UNESCO's report 'Behind the numbers: Ending school violence and bullying' highlighted the extent of the problem, with almost one in three students worldwide reporting being bullied at least once in the preceding month.
- Youngsters with mental stress: Young people who experience cyberbullying are at a greater risk than those who don't for both self-harm and suicidal behaviours. 83% of young people believe social media companies should be doing more to tackle cyberbullying on their platforms.
- Increased incidence of cyberbullying and online child sexual exploitation by adults. School closures as a response to the COVID-19 lockdowns led to an unprecedented rise in unsupervised screen time for children and young people. This in turn exposed them to a greater risk of online violence.

What steps have been taken so far:

- UNESCO in partnership with NCERT has brought out an information booklet on Safe Online Learning in Times of COVID-19.
- The Department of School Education and Literacy has circulated exhaustive guidelines to raise children and parental awareness to prevent the adverse

effect of online gaming and the psycho-emotional stress that children could be undergoing.

Way forward

- Raise cybersecurity awareness so that girls and women can take the necessary precautions.
- Schools, universities, universities and communities must play an active role in raising awareness.
- Social media intermediaries need to be involved and advise users not to host, view, upload, modify, publish, send, store, update, or share illegal information.
- International cooperation needs to continue to tackle cybercrime from abroad.
- To assist the police, government need to promote better infrastructure, special cybercells, regular training, and collaboration with cyber experts.
- Forensic research institute skills need to be strengthened so that evidence of cyberbullying can be collected in a timely manner.
- Prompt and swift prosecution of cybercrime also helps to instill public confidence.

38. Analyse the problem of online indoctrination of youth by terrorist organizations. How can this be addressed? Suggest measures.

Approach

Candidates can start with reference to how indoctrination is evolving through the internet and then analyse how its online indoctrination is used by terrorist organisation, groups highlight some factors behind it. Give basic idea about how it impacts value system and then suggest some measures.

Introduction

Traditionally young, unemployed, vulnerable people were drawn into the net of indoctrination. Today we have instances of even educated youth falling prey to such methods due to modern means of communication with internet. Isolation, fear, anxiety, insecurity and real or perceived deprivations make youth vulnerable which are exploited by fundamentalists for social and political gains.

Body

Indoctrination:

- Indoctrination is the type of biasing the thoughts and thought processing. The words are used in reference to promoting a one-sided opinion as being

truthful, without allowing accesses to other ideas and with no reservation in calling it unjustifiably, the 'truth.

Factors behind indoctrination:

- Social media, which provide connectivity, virtual participation and an echo-chamber for like-minded extremist views, accelerates the process of radicalisation.
- Social media has played a major role in the radicalisation process of lone-wolf actors, who have used the internet to educate themselves on radical information and propaganda.
- Extremists' groups recognise the numerous attributes of the Digital media in the dissemination of radical propaganda to the world.
- As a result of which, such actors have begun to employ the internet in facilitating activities such as psychological warfare, publicity and propaganda, recruitment, planning and coordination networking and fundraising, to name a few; with the initial two items being major areas of concern in terms of online applications.
- Individual socio-psychological factors, which include grievances and emotions such as alienation and exclusion, anger and frustration and a strong sense of injustice.
- Socio-economic factors, which include social exclusion, marginalisation and discrimination (real or perceived), limited education or employment etc.

Instances of Radicalisation in India:
- Cases have revealed instances of internet-facilitated indoctrination and active radicalisation in multiple states.
- Indoctrination of youth by ISIS: In early 2020 the Islamic State of Iraq and Syria (ISIS) published an India-centric propaganda material called Voice of Hind.
- The United Nations' 26th report of the Analytical Support and Sanctions Monitoring Team concerning the IS (Islamic State), al-Qaeda and associated individuals and entities had pointed out "significant numbers" of the IS and al-Qaeda members in Kerala and Karnataka.
- Instances of Left-Wing Extremism (LWE) have grown despite the continued government intervention with use of dark web and dark net. Encounters, ambushes and arrests still occur with regular frequency in the red corridor districts.

It causes changes in their value system:

- Growing intolerance – parochial interests and hatred against others.
- Attracted towards wrong means like violence to protect their religion. This makes them to take up arms and ammunitions leading to religious militancy.
- Loss of human values. Join terror groups to create violence against humans.

Ways to prevent:

- Regulation of internet: There is a need to draw guidelines to regulate the internet. o This must be done without damaging the privacy of an individual. An effort is needed to place an effective mechanism to trace the activity of radical groups.
- Strict measures: Vigilance, investigation and micro observing in the suspected areas.
- Rehabilitation: to rehabilitate the youth who are prone to radicalization and giving right livelihood.
- Divide and conquer: When one group is able to infiltrate the opposing side's extremist groups, or establish relationships with ambivalent members of those groups, they can begin to create a wedge between members
- Skilling and re-skilling: Most of the youth are deprived by resources and poverty. Basic income can make their life to channelize to mainstream.
- Peace building: This approach, which is aimed at addressing the underlying conditions, which foster extremism through democratization, strengthening human rights.
- Community model: The success of Kerala and Maharashtra programmes of deradicalization indicates how community-based programmes may work in vulnerable states. The disaffected youth with no real job prospects and limited futures are vulnerable.

Conclusion

Today, fundamentalism and indoctrination pose greatest threat to the peace and development of society and nation. Government should adopt multipronged approach like equitable development (minorities, poor population), strengthening education system (moral values, teaching essence of different religions), creation and broadening access to employment opportunities, modern and well-equipped security and intelligence agencies and push for international coordination.

39. India's rapid digital growth makes it particularly vulnerable to cyber attacks. Do you agree? Examine the enormity of the effects of a potential cyber-attack on India's digital infrastructure.

Approach

Candidate can write in detail threats and challenges to India's cyber infrastructure. In second part, ways to tackle challenge can be given along with the government initiatives

Introduction

Estimates of the cost to the world in 2020 from cyber-attacks/ cyber crimes is believed to be more than $1 trillion and in 2021 it was between $3trillion-$4 trillion. US defence secretary warned that the world had to prepare for a kind of 'cyber Pearl Harbour', highlighting a new era of potential vulnerabilities. Each succeeding year witnessed no change in the method of response despite an increase in cyber threats.

Body

The number of people having access to the internet In India is increasing day by day. Despite the untapped potential, India already is the 2nd largest online market worldwide. Although the advancement of technology and the internet has brought with it all related benefits but has also led to an increase in the cybercrime affecting people globally. The crime like the Pegasus snooping scandal, Wannacry attack has shown vulnerability of India to cyber-crime threats.

Cyber threats and challenges to India's digital infrastructure

- Cyber terrorism: It is premeditated, politically motivated attack against information, computer systems, computer programs, and data which results in violence.
- Digital Data Threat: Growing online transactions have generated bigger incentives for cybercriminals. Besides, establishments looking to mine data (customer information, results of product surveys, and generic market information), they also create intellectual property that is in itself an attractive target.
- Cyber warfare:It involves the actions by a nation-state or international organization to attack and attempt to damage another nation's computers or information networks.
- Cyber Infrastructure Concerns: Most equipment and technology systems are vulnerable to cyber threats just like any other connected system. Although the government has set up National Critical Information Infrastructure Protection Centre (NCIIPC), it is yet to identify and implement measures to protect critical information infrastructure.
- Lack of specialists: Globally, India ranks 2nd in terms of the number of Internet users after China (Internet World Stats, 2017). However, India has a negligible base of cyber-security specialists, when compared to internet user base.
- Lack of robust law enforcement mechanisms: India's approach to cyber security has so far been ad hoc and unsystematic. Despite a number of agencies, policies and initiatives, their implementation has been far from satisfactory.
- Lack of Coordination: Due to the existence of too many agencies with overlapping functions in the field of cyber security, coordination between these agencies is poor.

What can be done?

- Building capabilities: There is an urgent need to build capabilities and capacity for application, equipment and infrastructure testing.
- Human resource: Immediate attention has to be given to human resource development which would increase the number of experts who can effectively manage the cyber security of the country.
- R&D: Investments should be made on R&D to develop more innovative technologies to address increasing cyber security threats.
- Policy and Governance: It is important to bring a robust policy and effectively implement the same. Further, duties and responsibilities should be defined clearly for smooth functioning and better coordination among departments and stakeholders.
- Awareness: A periodic awareness campaign by the government and big private organizations should be conducted to aware people about cyber security threats.
- Strengthening Private Partnership: It is important to strengthen the public-private partnership on cyber security.

Various government initiatives

- Information Act, 2000: The Information Act, 2000 (amended in 2008) is the primary law for dealing with cybercrime and digital commerce in India.
- National Cyber Security Policy, 2013: The policy provides the vision and strategic direction to protect the national cyberspace.
- The CERT-In (Cyber Emergency Response Team – India): CERT-In has been operational since 2004. It is the national nodal agency for responding to computer security incidents as and when they occur.
- Indian Cyber Crime Coordination Centre (I4C):The Union Government has decided to set up 14C. It will be apex coordination centre to deal with cybercrimes.

Conclusion

India needs to secure its computing environment and IoT with current tools, patches, updates and best known methods in a timely manner. The need of the hour for Indian government is to develop core skills in cyber security, data integrity and data security fields while also setting stringent cyber security standards to protect banks and financial institutions.

40. What are the growing concerns about the weaponisation of space? Examine.

Approach

Student is expected to define space and write elaborately about weaponisation of space. In the second part, India's positon can be assessed in outer space. In the end, way ahead can be given.

Introduction

Space, also known as outer space, is the near-vacuum between celestial bodies. It is where everything (all of the planets, stars, galaxies and other objects) is found. On Earth, space begins at the Karman line (100 km above sea level). This is where Earth's atmosphere is said to stop and outer space begins.

Body

Weaponisation of space

- Space militarisation involves placing and developing weapons and military technology in outer space. The initial space exploration in the mid-20th century had, partly, a military motive, as the US and the USSR used it as an opportunity to demonstrate missile technology and other technologies having military application potential.
- Outer space has since then been utilised as an operating location for military spacecraft like imaging and communications satellites, and some ballistic missiles passing through outer space during their flight.
- During the Cold War, the two superpowers namely, the USSR and the USA spent huge proportions of their Gross Domestic Product on developing military technologies. As the Cold War came to an end with the implosion of the USSR, the space race between the 2 superpowers also subsided. The USA was left as the only superpower on the planet with a big concentration of the globe's wealth and technological advancement.
- Despite the United States' new status in the world, the monopoly of space militarisation can in no way be taken for granted. Nations like Japan, China, and India have begun their space programmes, while the EU (European Union) collectively works to create satellite systems to rival those of the US.
- There is no global regulatory regime to address the growing militarisation in space which compel India to develop deterrence for the security of its space-based assets.
- Anti-satellite technology has so far been in the hands of very few countries: United States, Russia and China.
- The acquisition and demonstration of this technology make India a member of an elite group of countries.
- Outer space is becoming an arena for technological shows of force whether by deployment of spy satellites or testing of weapons.

- Missiles are one aspect of space warfare, there are several equally effective methods like lasers, to incapacitate satellites that are being developed and are of equally serious concern.

India and race of outer space

- Recently, India carried out an anti-satellite (ASAT) test using an interceptor missile (as a kinetic kill vehicle) to neutralise a target satellite (possibly the Microsat-R launched in January this year) in a Low Earth Orbit (LEO) at an altitude of around 300 km.
- Many countries raised concerns over ASAT.
- India has no intention of getting into an arms race in outer space. India has always held that space must be utilised for peaceful purposes only.
- India does not support the weaponization of Outer Space and actively supports international efforts to reinforce the safety and security of space-based assets.
- India maintains that Outer space is the shared heritage of mankind and it is the responsibility of all space-faring countries to safeguard and foster the benefits flowing from developments made in space technology and its applications for all. India is a party to all the major international treaties connected with Outer Space.
- India already implements many Transparency and Confidence Building Measures (TCBMs) – including registering space objects with the United Nations (UN) register, pre-launch notifications, measures in harmony with the UN Space Mitigation Guidelines, participation in Inter-Agency Space Debris Coordination (IADC) activities concerning space debris management, undertaking SOPA (Space Object Proximity Awareness and COLA (Collision Avoidance).
- India has been taking part in all sessions of the UN Committee on the Peaceful Uses of Outer Space.
- India supported UNGA resolution 69/32 on No First Placement of Weapons in Outer Space.
- India sees the No First Placement of weapons in outer space as only an interim step and not a substitute for concluding substantive legal measures to ensure the prevention of an arms race in outer space, which should continue to be a priority for the international community.
- India supports the substantive consideration of the issue of Prevention of an Arms Race in Outer Space (PAROS) in the Conference on Disarmament where it has been on the agenda since 1982.

Way ahead

- Taking into account the extreme fragility and volatility of the outer space environment, it must not be permitted to turn into another battlefield or a scene for military conflicts that could have disastrous implications.

- Outer space is a common heritage and asset owned equally by every human being. So, there is a clear need for a legally binding instrument to prevent an arms race and fill existing legal gaps.

Conclusion

The scale of the challenges and opportunities in outer space, however, demand more urgent and sweeping reform. That can only be mandated by the highest political level. Some instruments can be developed which can have all-inclusive scope that includes 4 prohibitions: the placement of any weapons, defensive or offensive; armed attacks against satellites or any outer space assets; intentional, harmful interference that interrupts the normal functioning of such assets; and developing, testing and stockpiling weapons designed to attack outer space assets.

41. The rise of Taliban in Afghanistan has renewed India's security threats.do you agree? critically analyse.

Approach

A simple straightforward question where candidates are expected to write about rise of Taliban in Afghanistan and how it poses threat to the India's security. Candidates should give their opinion about it and examine this issue critically.

Introduction-

Afghanistan has been plunged into chaos after the Taliban took over in the wake of the pullout of American forces from the country. It not only ensured a swift Taliban advance across Afghanistan but also a peaceful surrender of Kabul. Seeing the past record of Taliban regarding human right violations and terrorist activities then Taliban's entry into Kabul marks the beginning of a new phase in the relationship between Afghanistan and India. Hence India need to be more cautious for its security threats .

Body-

The Taliban has taken control of Afghanistan, as of 16th August 2021. The quick collapse of the government in Afghanistan, and the Taliban taking over the presidential palace, seem to have triggered panic and fear among the people in Afghanistan,

- They returned to power in Afghanistan in 2021, twenty years after their ouster by U.S. troops. Under their harsh rule, they have cracked down on women's rights and neglected basic services. By coming back to power raised many security related questions in the region.

- India had been hesitant in exploring engagement with the Taliban and ended up withdrawing from the country. However, it has legitimate interest in the stability of Afghanistan and enjoys goodwill among all communities.

Challenges For India-

- Issue of Indian Security: The restoration of Taliban rule in Afghanistan presents some very serious potential challenges for Indian security.
- The challenges range from securing its development infrastructures to safely evacuating Indians stranded in troubled Afghanistan.
- Spread of International Terrorism: For India, a bigger challenge will be about the Taliban's renewed support for international terrorism and Pakistan's re-direction of jihadi groups that have allegedly fought with the Taliban towards India.
- Religious Fundamentalism: Like all radical groups, the Taliban will have trouble balancing its religious ideology with the imperatives of state interests.
- India faces a challenge to deradicalise the region for long lasting peace and stability.
- New Regional Geopolitical Developments: There can be new regional geopolitical alignments (such as China-Pakistan-Taliban) which may go against the interests of India.
- Meanwhile, the US withdrawal compels the creation of a new balance of power system in and around Afghanistan.
- Moreover, the US and the West will try to shape the international attitudes towards the new regime.
- No Contiguity With Taliban: Unlike Pakistan, China and Iran, India has no contiguity with Afghanistan.
- Russia has a security treaty with Tajikistan, for instance, and has deployed more troops there to prevent a destabilizing spill over from the turmoil in Afghanistan into Central Asia.
- India has no such security responsibilities and no direct access to Central Asia.
- This may give reasons to the Taliban to hit back at India through Pakistan in J&K, given that LeT and Jaish are operating in Afghanistan alongside the Taliban.

India's Options-
- Broader Diplomatic Engagement: India should consider appointing a special envoy dedicated to Afghanistan. The envoy can ensure that Indian views are expressed at every meeting, and broaden engagement with the Taliban.
- Decoupling of Taliban-Pakistan: Although Pakistan's leverage over the Taliban is real, it may not be absolute.
- The Taliban is bound to seek a measure of autonomy from Pakistan. India will have to wait a while before the current issues between India and the Taliban can be overcome.
- Balancing the Opportunities in Afghanistan: Structuring the internal balance of power within Afghanistan has always been hard. A deeper Sino-Pak partnership in Afghanistan will inevitably produce countervailing trends.

- However, for a patient, open-minded and active India, there will be no dearth of balancing opportunities in Afghanistan.
- Leverage Indian Infrastructural Developments: Indian USD 3 billion assistance to Afghanistan is in concrete projects that serve its population and have earned it their goodwill that will endure.
- The need today is to not stop the development work in Afghanistan and continue the good work.
- Global Cooperation: There is a lot less global acceptance of terrorism today than in it was in the 1990s.
- No major power would like to see Afghanistan re-emerge as a global sanctuary of terror.
- The world has also imposed significant new constraints on Pakistan's support for terror through mechanisms like the Financial Action Task Force.

Way Forward-
- Engaging with the Taliban: Talking to Taliban would allow India to seek security guarantees from the insurgents in return for continued development assistance.
- India can also persuade the Taliban to explore the possibility of its autonomy from Pakistan.
- Fighting Global Terrorism: There is a need for the global community to fight against the global concern of terrorism.
- In this context, it high time to adopt the Comprehensive Convention on International Terrorism (proposed by India at UN in 1996).
- Regional Cooperation: With the resurgence of Taliban, there is a convergence of interests between India and three key regional players - China, Russia and Iran in seeing a political settlement in Afghanistan.
- Thus, there is a need for cooperation from likeminded countries on this front.

Conclusion-

India, as would be impacted by the consequences of American withdrawal, has to work with Taliban and other regional powers to protect its interests and stabilize Afghanistan. If India remains active and patient too, many opportunities could open up in the new Afghan phase.

42. With the help of relevant examples, explain different sorts of nexus between organised crime and terrorism.

Approach

Candidates can start with reference to what is organised crime or start with highlighting the nexus of terrorism and organised crime. And then as question

demands simply give examples of such nexus. Also suggest some measures in the end.

Introduction

Terrorism and organised crimes like money laundering, drug trade, weapons trade, human trafficking, fake currency are conjoint twins that pose a great threat to the world through their syndicate and their deadly effects. As to carry out terrorist activity a lot of money is required so, terrorists engage in organised crime to fund their terrorist activity. Organised crime is the main source to generate money for terrorists.

Body

UN Convention against Transnational Organised Crime defines an organised criminal group as:

- A group of three or more persons that were not randomly formed; existing for a period of time; acting in concert with the aim of committing at least one crime punishable by at least four years' incarceration; in order to obtain, directly or indirectly, financial or other material benefits.
- Organised crimes are done with the motive of monetary gains by illegal means. Organised crimes are transnational in nature. Their presence is a great threat to the country's security.

Examples showing the relationship between organised crime and terrorism:

- Mumbai, being a financial capital has also hosted numerous criminal syndicates for a long time. The infamous global terrorist Daud Ibrahim ran his criminal group from Mumbai before he escaped after 1992 bomb blasts.
- The Criminal groups are still engaged in various activities like money laundering, FICN smuggling, etc though the old menace of extortion and contract killing has stopped now to a large extent. The FICN i.e. the Fake Indian currency notes and its smuggling is the main source of terrorist financing.
- Human trafficking, drug trafficking and gun-running are some of the other criminal activities that have been common sources of funds for terrorism.
- In the Northeast, extortion is the fundamental basis for funding all forms of terrorism. In addition to this, kidnapping has been used extensively for spreading terror and raising funds.
- In the Maoist terror movements, extortion is yet again a common phenomenon. They have also indulged in robberies of banks to fund their movement.
- The linkages in Kashmir exist at different levels. The external sources fund the terrorist activities. These funds reach Kashmir through various means. Funds

mobilized in Pakistan are channelized through Gulf countries fronting various organizations.

- Lashkar-e-Toiba. Besides, external funds are also routed through select organizations and individuals in Kashmir
- Money laundering plays a significant role. Hawala (money laundering) transactions take place swiftly and effectively in Kashmir. Besides, it is also believed that the ISI uses drug money to fund militant activities in Kashmir.
- The spread of counterfeit currency and its smuggling acts as a major funding source for militants.
- The Indian Mujahideen have also resorted to crime to raise funds. This includes robberies, kidnappings, etc.
- The drug trafficking in Punjab is a major path to generate money for terrorist activities by Pakistan based groups. The local support to the drug trafficking makes it possible to grow. There are reports of ISIS converting Sikh separatist groups into drug cartels.
- India's proximity to drug-producing regions like Golden Crescent in the West and Golden Triangle in the East has always been a cause of worry.

Impacts of the nexus:

- The nexus between terrorism and organized crime is very dangerous as they both sustain through each other's help.
- They form a threat to national security and it is difficult to trace the activities of individual groups. The nexus makes the investigation even more complex with more layers to unravel.
- The financial support from organized crime is able to sustain terrorism and despite of counter-terrorism activities are rising, there is no stopping of their activities.
- Organized crime can convert itself into full-fledged terrorist groups. As a result, youth engaged in organized crime through petty activities are drawn into terrorism.
- The nexus threatens the sanctity of boundaries through unholy criminal-political nexus and corrupts the border administration.

Breaking the Nexus of organised crime-terrorism and Wayforward

- With increasing international pressure, increased understanding between governments of different countries the state funding of these terrorists is going down day by day so, for financial viability, their link with organised crime is increasing.
- There is a need for fine-tuning of the criminal investigation so as to find and establish links of a crime syndicate with terrorism.
- Improving coordination and establishing specialized units to investigate. The specialized unit must have competent human resources, finances, technical expertise and appropriate legal backing to work in an unhindered manner.

- The necessity of legal backing stems from the existence of numerous stakeholders such as state police, border security, financial sector, special units such as narcotics departments.
- The interstate coordination is necessary and an organization in the lines of the National Counter Terrorism Center to tackle the nexus. It will help in national and international coordination.
- India must continue to engage the international space for better policy, concerted actions against state-sponsored terrorism, and terrorist financing.
- The international cooperation can stem from UNSC resolutions and other institutional mechanisms such as FATF.

43. As India expands its border infrastructure rapidly, the country will be able to gain much-needed strategic leverage against the Chinese threat. Elucidate.

Approach

Candidates can start with reference to importance of border infrastructure how it helps to gain strategic advantage. Try to elucidate with China related threat and how India is countering it.

Introduction

India is bordering 17 states having the international borders with Pakistan, China, Nepal, Bhutan, Myanmar and Bangladesh. All of this border comprised of unique topography, culture and varied security and socio-economic challenges. With modern and integrated border infrastructure we can attain the leverage against threats from China.

Body

Significance of border infrastructure to gain strategic leverage:

- Connectivity and inclusivity are the important tools for national integration of far-flung areas such as Sikkim, Arunachal Pradesh and Ladakh, etc.
- Border road infra helps in maintaining peace and stability by controlling the security concerns related to inter-region and intra-region issues.
- Border road infrastructure plays a significant role in the overall development of the region, especially in harsh terrains such as Cold desert (Jammu Kashmir and Leh Ladakh).

Threats such as:

- Doklam is plateau land in Bhutan and extremely strategic to both countries. It protects the vulnerable Siliguri Corridor (also called Chicken's Neck), the only connection of Indian mainland to the northeast.

- The 2020 China–India skirmishes are part of an ongoing military standoff between China and India. This includes Pangong Tso Lake in Ladakh and the Tibet Autonomous Region; near the border between Sikkim. Additional clashes also took place at locations in eastern Ladakh along the Line of Actual Control (LAC).
- 2020 Tensions have their roots, in both China and India's expansion of military infrastructure along the LAC. India's construction of a feeder road that would connect with the road from Darbuk-Shyok in Galwan Valley to Daulat Begh-Oldi was a trigger to Chinese Officials. China saw this as an aggressive tilt in India's border strategy.

India's expanding Border infrastructure to gain Strategic advantage:

- India has been engaged in building up border infrastructure, including the all-weather 255 km Darbul-Shayok-DBO Road.
- Construction of the Darbuk-Shyok-DBO (DSDBO) road by India from Leh through Chushul — that leads to DBO, a military base with an airstrip was completed last year.
- DSDBO passes near the Galwan Valley. For China, the Galwan region provides a vantage point overlooking the road to DBO.
- For India, control of the Galwan valley gives access to the Aksai Chin plateau, through which part of the Xinjiang-Tibet highway passes.
- BRO constructed 144.41 km of roads in Uttarakhand and 55.17 km in Himachal Pradesh in the year 2021. Roads spanning 83.17 km and 52.84 km in Uttarakhand and 36.23 km and 28.83 km in Himachal Pradesh were constructed in 2020 and 2019 respectively.
- Roads prove integral to maintain such heavy deployment, however, the high altitude and rarefied atmosphere makes construction activities difficult.
- Border villages with sparse population, limited connectivity and infrastructure often get left out from the development gains. Such villages on the northern border will be covered under the new Vibrant Villages Programme, announced in the Budget 2022-23. The move has been taken to counter the Chinese 'model villages' close to the LAC (Line of Actual Control).
- Besides ensuring security, peace and tranquillity, the Indian Army is also engaged in infrastructure development. The Army patrols day and night on the remotest route along the border with China which does not even have proper road connectivity making the task even more difficult.

Conclusion

BRO has been frequently in news due to delays and other lacunae with regard to border road infrastructure Proper and defined autonomy with respect to 3F: Funds, Functions and Functionaries will help to boost the rapid development of border road infra, ultimately leading to economically integrated and strategically amiable South Asia.

44 Do you agree with the idea of allowing private players to compete with specialised security agencies like CISF? Substantiate your views.

Approach

Candidate can define role of CISF in securing important industrial establishments. In the second part, role of private players along with CISF can be analysed while considering various issues.

Introduction

Union home minister recently said that private security agencies and the Central Industrial Security Force (CISF) could join hands for providing effective security to various private industrial and manufacturing sector units. Government security agencies such as the CISF alone cannot render this task across the country and could gradually "hand over" to private security agencies, the home minister said.

Body

About CISF

- The Central Industrial Security Force (CISF) is one of the Central Armed Police Forces in India. CISF is a unique organisation in the paramilitary forces of India, which works to provide security cover to over 356 industrial units (including 13 Private Sector Units), government infrastructure projects and facilities and establishments located all over India.
- These include atomic power plants, space installations, mines, oil fields and refineries, major ports, heavy engineering, steel plants, barrages, fertiliser units, airports and hydroelectric/thermal power plants owned and controlled by Central Public Sector Undertakings (PSUs), and currency note presses.
- It was set up under an Act of the Parliament of India on 10 March 1969 with a strength of 2,800. CISF was subsequently made an armed force of India by another Act of Parliament passed on 15 June 1983. Its current active strength is 148,371 personnel.
- CISF also provides consultancy services to private industries as well as other organisations within the Indian government. The scope of CISF's consulting practice includes security consulting and fire protection consulting. It also plays a major role in Disaster Management. The CISF has a 'Fire Wing' which helps during fire accidents in Industries where the CISF is on guard.

CISF: a self-funded force

- In 1999, the CISF was given a mandate to provide technical consultancy services relating to security of any private or government sector establishment.

- Whenever a private sector establishment asks CISF for consultancy, a team of officials visits the place to be secured, does a survey and accordingly prepares reports and gives suggestions, for which the CISF is then paid.
- The consultancy wing of CISF has earned a revenue of Rs 172 crore to date. Last year, the force had earned Rs 3.2 crore, its highest revenue so far.
- So far the CISF has provided security-related consultancy to 158 government and private establishments, including TISCO Ltd, Bangalore Metro, IDBI and ICICI banks, India Bulls and thermal power projects.
- CISF has the largest number of women officers and personnel in various ranks among all Central Armed Police Forces. "These women personnel are trained in Filipino martial arts to put a strong fight in emergency situations and are deployed at major sites.

Why allowing private players compete with CISF is a good idea?

- In the country's journey from a $2.5 trillion economy to becoming a $5 trillion economy, many units in the manufacturing sector will be established and the CISF will face new scenarios.
- 1.64-lakh-personnel-strong force could soon see an enhancement in its role. The work of private security agencies is rapidly increasing CISF can take the responsibility of training these private security agencies.
- CISF will have to enhance the efficiency of the private security agencies as the CISF alone cannot render the task of securing the industrial and manufacturing units of the country.
- CISF can work to ensure that all the agencies involved in industrial security are as efficient as the force in securing the sector.
- A hybrid model of security, where the CISF will prepare the strategy and where both private and the CISF personnel can work, can be developed so that the paramilitary force can gradually come out and hand over these tasks to private security agencies.
- CISF can play a big and important role in the training and certification of the private security agencies in the country, which are currently functioning in an unorganised manner.
- Keeping in view the "increasing" drone threat to industrial units along sea ports and the land border, the CISF can collaborate with agencies like the Defence Research and Development Organisation (DRDO) and the Border Security Force (BSF) to prepare an effective counter-technology against this menace.

Conclusion

CISF along with the private players can play the role of a "specialist and integrated" security agency in the airport and seaport cargo, counter-drone, marine and rapid transport system domains. With increasing size of economy and increasing private players, more efficient and effective security infrastructure can be built.

45. Examine the role played by India's paramilitary forces in maintaining internal security.

Approach

Candidate can highlight the evolution of paramilitary forces from independence. While stating the functions of paramilitary forces, role played by them in maintaining internal security can be given.

Introduction

Since independence, India has been fighting for its sensitive areas such as poverty, national unity and nation's security. But the nation's security is the most critical of all because the growth in all the sector can be brought only if the nation's security remains intact. In ensuring the security of India, the paramilitary forces have played a vital role in almost all the critical matters of internal security and border security since 1947.

Body

Paramilitary forces

- A paramilitary is a semi-militarized force whose organizational structure, tactics, training, subculture, and (often) function are similar to those of a professional military. The term "Paramilitary forces" in India has not been defined in any acts or by authorities officially.

Major functions of force

- Safeguard the security of borders of India and promote a sense of security among the people living in border areas.
- Prevent trans-border crimes, smuggling, unauthorized entry into or exit from the territory of India and to prevent any other illegal activity.
- Provide security to sensitive installations, persons at security risk.
- Restore and preserve order in any area in the event of disturbance therein.
- Other Functions: Counter Insurgency Operations, Anti Naxal Operations, Internal Security Duties, VIP Protection, Lead Intelligence Agency, Security To Diplomatic Missions Abroad, UN Peacekeeping Operations, Disaster Management, Civic Action Nodal agency for UN Police Missions, etc.

Various paramilitary forces and role played by them maintaining internal security

- The Assam Rifles (AR) – led by Indian Army officers reporting to the Ministry of Home Affairs: they perform many roles including the provision of internal security under the control of the army through the conduct of counter insurgency and border security operations, provision of aid to the civilians in

times of emergency, and the provision of communications, medical assistance and education in remote areas

- The Special Frontier Force-led by Indian Army officers reporting to Indian Intelligence: SFF was raised with covert operations in mind, mainly along the Indo-China border, however SFF has been fielded by R&AW and the Indian government in various covert and overt operation theatres.
- Central Reserve Police Force (CRPF): It is India's largest Central Armed Police Force and also considered to be World's largest Paramilitary Force. It functions under the authority of the Ministry of Home Affairs (MHA) of the Government of India. The CRPF has played an increasingly large role in India's general elections.
- Border Security Force (BSF): It is a Central Armed Police Force charged with guarding India's land border during peacetime and preventing transnational crime at the same, it has various active roles during an outbreak of war. It is a Union Government Agency under the administrative control of Ministry of Home Affairs
- Indo-Tibetan Border Police (ITBP): It is one of the CRPF. The ITBP was intended for deployment along India's border with Tibet
- Central Industrial Security Force (CISF): its duties are guarding sensitive governmental buildings, the Delhi Metro, and providing airport security. It is directly under the Union Ministry of Home Affairs.
- Sashastra Seema Bal (SSB): It is mandated with significant role of guarding and intelligence across borders, especially India-Nepal and India-Bhutan
- National Security Guard (NSG): It is a counter terrorism unit under the Indian Ministry of Home Affairs. The NSG is trained to conduct counter terrorist task to including counter hijacking tasks on land, sea, and air; Bomb disposal (search, detection and neutralization of IEDs); PBI (Post Blast Investigation) and Hostage Rescue missions.
- Special Protection Group (SPG): It is an armed force of the Union for providing proximate security to the Prime Minister of India and former Prime Ministers of India and members of their immediate families wherever in the world they are.

Conclusion

These paramilitary forces act as our first line of defence against security threats to the nation. Hence, these forces need to be upgraded and trained to face new forms of challenges like cyber threats and space warfare, thereby making them ready for any such eventualities. The government should encourage the youth for joining the forces by making some special provisions.