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Q.1) One of the key components of the strategy to counter the threat emanating from a China-Pakistan axis is to strengthen border infrastructure. Do you agree? Substantiate your views.

Approach

Candidates need to highlight threats related to China and Pakistan and highlight on China Pakistan axis. Also write about the importance of Border security infrastructure to tackle the China Pakistan axis.

Introduction

Relationship between China and Pakistan developed over the 1970s and '80s. Countering India was one of the key pillars. It opens a two-front war possibility for India to tackle it India should strengthen its security apparatus on borders.

Body

Threat to India's security ecosystem on borders:

- Pakistan is able to sustain cross-border terrorism despite a domestic Balance of Payments crisis, using Chinese funds and material (including Chinese-made grenades).
- They're able to combine their efforts in destabilizing border management by exploiting open & porous borders with Myanmar and Bangladesh.
- Passing of CPEC through POK affects the sovereignty and territorial integrity of India.
- Pakistan is all set use BeiDou for both military purposes on borders, ending their dependence on the US-based Global Positioning System.

Strengthening border infrastructure to tackle China Pak axis:

- Border road infra helps in maintaining peace and stability by controlling the security concerns related to inter-region and intra-region issues.
- Creating infrastructure: India is also constructing some critical bridges to cut down time for troop movement such as Dhola – Sadiya bridge.
- India has joined hands with Japan to aggressively develop infrastructure projects in North east to contain China.



- To increase capability tender for purchase of six Border Surveillance Management Systems (BSMS) to cater to the needs of Indian Army's peace time requirements for countering the infiltration attempts from Pakistan.
- BOLD-QIT is a project to install technical systems under the Comprehensive Integrated Border Management System (CIBMS), which enables the BSF to equip Indo-Bangla borders with different kinds of sensors in the unfenced riverine area of Brahmaputra and its tributaries.
- The UAVs and other surveillance gadgets already under installations have significantly reduced the incidents taking place due to human error.
- The mini UAVs are also intended to carry out reconnaissance in Jammu and Kashmir for counter insurgency along with the LoC with Pakistan and the Line of Actual Control with China.

Conclusion

The traditional approach to border management on Pakistan and China borders, i.e. focussing only on border security, has become inadequate. India needs to not only ensure seamlessness but with the adoption of new technologies for border control and surveillance and the development of integrated systems for entering, exchange and storage of data, will facilitate the full proof border security without endangering security personnel and internal security of India.

Q.2) How do you define terrorism? How is it related to organised crime? Has the linkage between organised crime and terrorism evolved in recent years? If yes, how?

Discuss

Approach

Students are expected to give basic information of both organized crime and terrorism and explain how both are interlinked and related to each other in many cases. Also discuss whether this type of linkage are recent phenomenon or not.

Introduction

Organised crime is a category of transnational, national, or local groupings of highly centralised enterprises run by criminals who intend to engage in illegal activity, most commonly for money and profit. While terrorism is a Violent, criminal acts committed by individuals and/or groups who are inspired by, or associated with, designated foreign terrorist organisations or nations (state-sponsored).



Body

Nexus between organised crime and terrorism

- Terrorist groups need arms and money to fight against security forces. The organised criminals and terrorist groups become clients of each other. Organised criminals groups smuggle arms, drugs, cattle, humans to generate money for terrorist groups.
- Terrorist groups always try to destabilise the country and bring down the morale of security forces. When the terrorist groups are unable to confront the security forces directly, they turn towards organised criminals. Thus organised criminals indirectly help these terrorist groups.
- Organised criminal groups generally establish a strong communication network. These organised groups act as eyes and ears of the terrorist groups.
- Terrorist organisations in India, especially in the northeast, mobilise funds by becoming couriers of illegal drugs and arms and at times even human beings from one point to another within the country.
- Terrorists are always in need of money. As they fail to mobilise large amounts of money, they take the help of organised criminals to exchange counterfeit currency with arms.

Penetration of Organised crime and its link with terrorism:

- Besides Kashmir and the northeast, sporadic incidents in other parts of India like the Bombay blasts, for instance, have exposed the connection between terrorism and organized crime.
- This is distinct from the traditional linkages flourishing between organized crime syndicates and local criminals.

Conclusion

There is a need to develop effective and tailor-made responses to the organised crime and terrorism, which address the underlying causes of the convergence at all levels, based on strong evidence, engagement with local actors, good governance, enhanced services delivery and capacity building and the incorporation of normative frameworks.



Q.3) Examine the significance of robust intelligence for internal security. What are the key elements for the success of intelligence agencies? Discuss.

Approach-

Candidates need to examine the significance of robust intelligence for internal security. Also discuss the key elements for the success of intelligence agencies.

Introduction:

Any fight against terrorism, insurgency and internal security would be incomplete without a strong and a robust intelligence network, feedback or its analysis.

The significance of robust intelligence for internal security

- In India there is a thin line between external security threat and internal security threat. We live with an aggressive neighbourhood.
- National Intelligence Grid (NATGRID) was created in 2012 and due to some circumstances, it slowed down. The present government is reviving it to give it a practical shape. This is known to be a robust intelligence gathering mechanism.
- By recognizing patterns on the network and clustering them, AI proceeds to detect any deviations or security incidents from the norm before responding to them.
- Potential threats with similar traits to those recorded get blocked early enough.
- The fact that AI keeps learning makes it difficult for hackers to beat its intelligence.
- All the intelligence agencies in the country sit together, coordinate and analyse all the intelligence information available and analyse the real threat and pass on to agencies which are required to take counter action.
- Technology that uses AI, such as a residential proxy, can help you to transfer data.
- It can also detect and identify any threats hidden in the sea of chaotic traffic
- The present scenario of the country is that the threat from outside is not only along borders but anywhere in the country. All the states have to remain alert and they have to coordinate and share the intelligence gathered. In the same manner centre should also share the intelligence with the states.

The key elements for the success of intelligence agencies



For the success of intelligence agencies, the following key elements are generally required:

- No counter terrorism programme in the world would be complete without use of the latest technology.
- With the coordination of Technology intelligence and human intelligence we can get real time information which is required for action against the terrorist threat or any other threat to the country.
- The robust intelligence that tips off to an impending cyberattack or any attack on internal security should be timely. Putting together the indications that an attack was coming after it already happened is not.
- At its core, intelligence must be of value to the end consumer. In order to achieve that goal, it must be actionable, timely, and relevant. Data feeds are often timely, but because they are predicated on volume, they are rarely actionable or relevant.
- The foundation of the threat intelligence ecosystem is, and always will be, data. No intelligence program can survive without data.

Conclusion

The increasing rate of cyber-attacks has posed a great challenge in the recent times. AI gives the much-needed analysis and threat identification that can be used by security professionals to minimize breach risk and enhance security posture. AI can help discover and prioritize risks, direct incident response, and identify malware attacks before they come into the picture. So, even with the potential downsides, AI will serve to drive cybersecurity forward and help organizations create a more robust security posture

Q.4) The vision of tapping the potential of India's massive digital transformation must be balanced with a strategy to counter the associated security threats. Elucidate.

Approach

Candidates need to write about the digital transformation in India and with increased digital penetration write about the associated threats and suggest strategy to tackle such threats.



Introduction

Towards vision of tapping the digital transformation, 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 and vulnerability of India to cyber-crime threats is more.

Body

Threats with digital transformation:

- Low end use digital financial education: With limited awareness about digital financial service, person is always vulnerable to external threats.
- Phishing: is the fraudulent attempt to obtain sensitive information such as usernames, and passwords.
- Cyber terrorism: premeditated, politically motivated attack against information, computer systems and data which results in violence.
- Pishing/Social engineering: Vishing works like phishing but does not always occur over the Internet and is carried out using voice technology.
- Hacking: Hackers intrude into others financial domains and make financial transactions into their digital accounts.
- Cyber Ransom: Ransomware is a form of malware that encrypts a victim's files. The attacker then demands a ransom from the victim to restore access to the data upon payment.
- Ineffective firewall system: This can be ineffective in tackling the virus/corrupt files with an intent to collect crucial information.
- DDoS Attack: It is a malicious attempt to disrupt normal traffic of a targeted server, service or network by overwhelming the target or its surrounding infrastructure.
- Unregulated Cryptocurrency: Any cyber-attack (Crypto-Jacking) on such financial transactions can be a potential threat with no regulations available.

Strategy to counter the security threats:

- R&D: Investments should be made on R&D to develop more innovative technologies to address increasing cyber security threats.
- 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.



- Policy and Governance: Further, duties and responsibilities should be defined clearly for smooth functioning and better coordination among departments and stakeholders.
- India should become signatory to cybercrime convention (Budapest Convention) which puts a hurdle in dealing with transborder crime particularly.

Conclusion

With estimates of India creating \$1 trillion of economic value from the digital economy by 2025. India should not loose on the cyber-attack front. Government and the private sector jointly have to give cyber security some priority in their security and risk management plan.

Q.5) The role of media has changed in recent years. There is an acute dearth of independent and unbiased journalism. What makes the situation worse is the rampant misuse of media to polarise the society. Comment.

Approach

Students are expected to give basic information on role of media and then comment on changing role of media with advent of new age social media and different apps. How it created yellow journalism and polarised the situation.

Introduction

The role of the media is vital as a watchdog for uncovering errors and wrongdoings in the democracy. Media provides the platform for people tend to discuss & debate news over any topics. This interaction of people from varied backgrounds strengthens civil engagement in society.

Body

Changing role of media:

- Fake news: Fake news is not a new phenomenon which is linked to the rise of social media. The emerging threat of fake news could have an unprecedented impact on election cycle, raising serious questions about the integrity of democratic elections, policy-making and our society at large.



- Use of tech: Computational propaganda is the use of algorithms, automation, and human curation to purposefully distribute misleading information over social media networks.
- Unable to balance competing interests: Media companies have been unable to balance the national security concerns with the capitalist motivations of profit.
- Half-baked Opinions: Media anchors for increasing viewership can comment on law and order and national security matters without responsibility.
- Intolerance to Contrary views: One of the most common criticisms of embedded journalism or media is that it creates echo chambers where people only see viewpoints they agree with further driving us apart for polarization.

Making situation worse:

- With the advent of social media, technological changes, the reach of media has grown profoundly. Its reach and role in impacting public opinion have made it even more important worse.
- The sensationalism-driven reporting compromised the identities of rape victims and survivors despite SC guidelines.
- Fake news, yellow journalism are important concerns which are influencing public and impacting national security. For instance, fear mongering through media has led to mob lynchings, attacks on the migrant population.

Conclusion

In developing countries like India, the media have a great responsibility to fight backward ideas such as casteism and communalism and help the people in their struggle against poverty and other social evils. Hence, having journalistic ethics in place becomes very important.

Q.6) Discuss the security threats emanating from money laundering activities.

What steps have been taken by the government to check money laundering?

Discuss.

Approach-

Candidates need to explain the security threats emanating from money laundering activities. Also mention the steps taken by the government to check money laundering.

Introduction:



India is extensively gripped under crime of money laundering. Money laundering is usually used by criminals to hide money made through illegal act. It is the process by which huge amount of money obtained unlawfully, from drug trafficking, terrorist activity or other severe crimes. India is among the high-risk areas for money laundering. Therefore, the Indian government needs to take Anti-Money Laundering measures together with their developing economies.

The security threats emanating from money laundering activities.

- Even though the use of emerging technologies like artificial intelligence, machine learning, and big data for countering financial crimes, insufficient anti-money laundering systems are contributing to increasing money laundering and terrorist financing activities.
- As we navigate through the debate on crypto's future in India, mere imposing a 30 per cent tax on digital assets is not enough as money laundering and hawala-based transactions are growing significantly via cryptocurrencies on the Dark Web, putting India's national security at risk.
- Grave concerns are there over the misuse of digital coins on the Dark Web for terror acts and drugs trafficking by militant organisations, and for money laundering and hawala-based transactions — posing a serious threat to national security and a big challenge to the security agencies in the country.
- We have to realise that if we do not take effective appropriate steps fast, this crypto-based tech is going to be extensively used by terrorists for the purpose of targeting the sovereignty, security and integrity of India.

Steps taken by the government to check money laundering

- Governments have taken specific measures in the past to prevent money laundering. The purpose of these measures is to prevent financial crimes and ensure the administrative and economic stability of the country.
- The governments of India aim to protect the country from money laundering risks through laws and legal mechanisms.
- India enacted the Prevention of Money Laundering Act in 2002.
- The laws and regulations prior to this law were insufficient to combat money laundering.
- The Prevention of Money Laundering Act has entered into force to combat money laundering and prevent money laundering.
- The money laundering crime in India has huge penalties. According to AML laws in India, people committing money laundering offenses are sentenced to up to 10 years in prison.



- The Financial Intelligence Unit of India (FIU-IND) is the organization responsible for the fight against the financial crimes of India under the Ministry of Finance. Businesses with AML obligations report to the Financial Intelligence Unit.
- RBI also has some regulatory powers to prevent money laundering.
- In addition, India is among the countries that are members of FATF. FATF is a global organization established to prevent money laundering all over the world.
- By publishing AML guidelines, FATF aims for countries to fight financial crime more effectively. The FATF member states' AML regimes must comply with FATF recommendations.

Conclusion

There is a lot to consider regarding AML trends and typologies. The fight against money laundering and cybercrime has been an arms race since the dawn of the internet. Failure to take the necessary measures increases money laundering crimes in India and undermines India's reputation in the international arena. Now more than ever, it's essential to stay up to date.

Q.7) Adherence to fundamentalism has little correlation with one's education or socioeconomic status. Critically comment.

Approach

Candidates need to write about the fundamentalism and explain it. Then provide both side of arguments fundamentalism due to lack of education and worst socioeconomic conditions also highlight other factors leading to fundamentalism.

Introduction

Fundamentalism refers to one's unwavering belief in the infallibility of the religious / philosophical scriptures in all matters of faith, religion and philosophy. The attachment or belief is such strong that the believer takes a militant stand sometimes.

Body

Fundamentalism due to lack of education or poor socioeconomic status:



- Many fundamentalists are characterised as intolerant of those with views in opposition of their own or those with secular beliefs this is due to lack of secular education.
- Lack of quality education leading to blindly follow rules and regulations and beliefs propounded by religion. For example madrasa or gurukuls or church based study.
- Uneven development, class divisions, poverty and unemployment aggravates insecurity in the common men which make them vulnerable to political manipulation.
- The failure to adopt the scientific and technological education and thus, insufficient representation in the public service, industry and trade etc has led to the feeling of relative deprivation among marginalized section due to which they get influenced.

Fundamentalism despite good economic status and education:

- Many top highly educated personalities have propounded the fundamentalism such as Osama bin laden.
- Large number of well educated people support and speak the same way as the fundamentalist leaders speak and advocate against the scientific thought or new ideas.
- It is often accused of sensationalism and disseminates rumours by social media and mainstream channels which sometimes resulted into further communal tension.
- Technological advances, such as TV, cable television and satellite transmission, have facilitated the rise of 'e-religion'.

Conclusion

Today, religious fundamentalism poses greatest threat to the peace and development of society and nation. Government should adopt multipronged approach like equitable development of minorities, poor population, strengthening education system moral values, teaching humane essence of different religions, creation and broadening access to employment opportunities to all.



Q.8) Do you think economic and political instability in the neighbouring countries can create security threats for India? Substantiate your views.

Approach

Students are expected to give basic information on neighborhood instability like Pakistan and Sri Lanka and explain how it will impact the India's security what will be threats.

Introduction

Sri Lanka is facing its worst-ever economic downturn while Pakistan is witnessing an intense political struggle. While Taliban hardliners continue to tighten their iron grip on Afghanistan there is civil war-like situation in Myanmar this type of surrounding can impact our security.

Body

Economic and political instability and threats to security of India:

- India is expected to closely monitor the developments in neighborhood given its long history of issues with its neighbour.
- With socio-cultural identities cutting across the borders and recent instability it is a bit obvious that there are some contentious issues with the neighbours.
- Pakistan actively supporting various terrorist groups to carry out another Pulwama-like incident in the India with new establishment it can push such acts more.
- Political instability and disorder in its periphery impacts India's security directly or indirectly. Proxy war between India and Pakistan adds to this security risk.
- Instability situation can give rise to active support to radicalise the youth of not just Kashmir but also Punjab and Northeast India is very detrimental to India's demographic dividend.
- The issue of drug smuggling is also destroying the social fabric of Indian society due Pakistan Myanmar vicinity and to India being in the middle of the 'Golden Crescent' and 'Golden triangle'.
- One major threat perception is related to the Rohingya Muslim community and Tamilians entering Indian borders illegally due to persecution and difficulties in their home country this can create refugee crisis.
- The situation has worsened due to the changed demographic profile of many Border States and shift in ethnic balance of communities as a result of illegal migration for example Assam.



Conclusion

India should show the farsightedness for regional integration and multilateralism. Since changing geography is not possible India should be prepared for any instability and unforeseen adventure by the neighbouring country while also exploiting all the diplomatic and peaceful channels to resolve disputes.

Q.9) Do you think the shifting global focus towards Europe as a fallout of ongoing Ukraine crisis can create a security void in the Indo-Pacific region? What will be its possible implications for India? Discuss.

Approach-

Candidates need to give their views on the possibility of shifting global focus towards Europe as a fallout of ongoing Ukraine crisis in creating a security void in the Indo-Pacific region. Also discuss be its possible implications for India.

Introduction:

The war in Ukraine and the ensuing economic sanctions imposed on Russia will cause far bigger shifts for Europe's economy and markets than previous crises like the coronavirus pandemic. Inflation, reduced growth, and in some countries even another recession is just some of the risks facing the economies of emerging Europe as a result of Russia's invasion of Ukraine.

The shifting global focus towards Europe as a fallout of ongoing Ukraine crisis and creation of a security void in the Indo-Pacific region

- In light of Russia's unprovoked invasion of Ukraine, European leaders have been forced to rapidly accelerate plans to reduce their outsized dependence on Russian energy.
- Attention has focused on the sea change in European attitudes to security threats, the defence spending that Russia's aggression has produced, and the sobering challenge Russia's invasion poses to accepted international rules and norms.
- But the Ukraine crisis has wider implications, affecting the Indo-Pacific region.
- Although the crisis in Ukraine directly affects European security, its effects will ripple across the Indo-Pacific region.
- China is unlikely to follow Russia's power play and attack any of its neighbours any time soon.



- However, Russia's willingness to wage open war on Ukraine will weigh on the minds of Asian policymakers as they make decisions about boosting their own defence spending, seeking security guarantees from the U.S., and joining multilateral security coalitions.
- The war in Ukraine, now in its seventh week, defence cooperation and several other aspects that are at the heart of the bilateral ties emerged as the focus at the talks that come as the world grapples with challenges emerging due to one of the worst wars in Europe in decades and the pandemic that started two years ago.
- Russia's action has highlighted the limits of NATO's reach and resolve in the European theatre, leaving one wondering how far NATO, or its member states, would be willing to involve themselves in a conflict in the Indo-Pacific region where most Western nations have fewer stakes.

Its possible implications for India

- India has become adept at balancing its relationships with major powers such as the U.S., China and Russia.
- Rapidly expanding ties and growing defence relationship between India and US, and India joining QUAD group led by the US has led to a strategic shift in Russia's foreign policy, pushing it to align with China.
- It also has a trilateral relationship with the U.S. and Japan and another one with Russia and China.
- India has been recently diversifying its defence relations with US, Israel, etc, leading to a reduction in Russia's share of Indian defence imports.
- Both India and Russia have a difference of opinion in understanding the concept of the Indo-Pacific.
- Russia opposes the term Indo-Pacific as the term is primarily a US-led initiative aimed to contain China and Russia.
- Russia does not accept the concept of QUAD. Instead, Russia supports the concept of Asia Pacific.

Conclusion

The Indo-Pacific strategy may be an afterthought as the Ukrainian crisis unfolds. Nevertheless, the conflict in Europe will have a bearing on how Asian policymakers think about their own security in the wake of Chinese assertiveness and Beijing's sovereignty claims in Asia. India should pursue and facilitate Russia's engagement in the Indo-Pacific. Russia's active engagement in the region would contribute to making the Indo-Pacific truly "free and inclusive".



Q.10) E-waste is a serious threat accompanying the digital revolution in India. Do you agree? What are the current provisions to address the challenge of e-waste in India? Critically review.

Approach

Candidates need to write about the E-waste pollution in India and its volume how it is creating the hurdle for clean sustainable digital revolution in India. Do the critical review of provisions of ewaste management and highlight how much they are efficient in addressing the challenges.

Introduction

India is the third-largest producer of e-waste after China and the United States. More than 95% of this waste is handled by informal sector. The unprecedented generation of e-waste is a cause of concern for digital revolution.

Body

E-waste serious threat:

- The e-waste stream contains diverse materials most prominently hazardous substances such as lead, PCBs PBBs mercury, PBDEs, brominated flame retardants (BFRs).
- E-waste releases harmful chemicals, on burning, which adversely impacts human blood, kidney and the peripheral nervous system.
- When it is thrown in landfills, the chemicals seep in the ground water affecting both land and sea animals.
- COVID-19 caused unnecessary short-term investment in technology, which leave us at risk with data being stored on a wide range of devices.

Provision of to address the challenge of ewaste:

- Laws to manage e-waste have been in place in India since 2011, mandating that only authorised dismantlers and recyclers collect e-waste. E-waste (Management) Rules, 2016 was enacted in 2017.
- Extended Producer Responsibility (EPR), along with targets. Producers have been made responsible for the collection of E-waste and for its exchange.
- Producer Responsibility Organisation (PRO) and Deposit Refund Scheme has been introduced as an additional economic instrument.



- Urban Local Bodies (Municipal Committee/Council/Corporation) have been assigned the duty to collect and channelize the orphan products to authorized dismantlers or recyclers.

Still more need to be done:

- Still as per MoEFCCC to NGT 95% of e-waste in India is recycled by the informal sector and scrap dealers unscientifically dispose of it by burning or dissolving it in acids.
- Gaps in collection targets, as the amount of e-waste collected in 2018-19 was 78,000 tonnes against a target of 1.54 lakh tonnes. Clear governance deficits on the subject.
- E-waste dismantling capacity has not been increased from 7.82 lakh tonnes since 2017-18.

Conclusion

There is need to identify the hotspot zone by constant vigil and to coordinate with the District Administration to prevent any damage local level environment and public health management should be clubbed to tackle and fill the gaps in address the challenges of ewaste.

Q.11) What do you understand by the ecosystem approach to conservation? Explain with the help of suitable examples.

Approach

Students are expected to give basic definition of the ecosystem approach. With suitable example explain how ecosystem approach work for conservation.

Introduction

The Ecosystem Approach puts people and their natural resource use practices squarely at the centre of decision-making. Ecosystem Approach can be used to seek a balance between the conservation and use of biological diversity.

Body

- The ecosystem approach allows a holistic view of how components work together, in other words, it can incorporate human dimensions into biosphere functioning.



- It also helps define the temporal and spatial scale of management, and thus, is a multidisciplinary approach in order to deal with complexities of ecosystem function and usage.
- For example conservation of wetland with help of Ramsar convention like 'Wise use' of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches.
- Diversity conservation with Biological Diversity Act, 2002 it secures sharing of benefits with local people as they are conservers of biological resources and enhance the conservation practices.
- Soil conservation with Organic practices such as crop rotations, inter-cropping, symbiotic associations encourage soil fauna and flora, improving soil formation and structure and creating more stable systems.
- Specifically the ecosystem approach to fisheries (EAF) implementing the new strategies gradually with the already existing rules and regulation. It could generate substantial income; as well as, improve the fragile ecosystem of aquarium species.

Conclusion

Ecosystems are an undervalued commodity in the current economic model and process of political decision making. There is need for a more change where human society places the conservation and sustainable management of ecosystems and the services they provide at the heart of decision making.

Q.12) What are the common strategies for mitigating the effects of a pandemic? Explain by taking the ongoing COVID pandemic as a case study.

Approach-

Candidates need to explain the common strategies for mitigating the effects of a pandemic. One should explain by taking the ongoing COVID pandemic as a case study.

Introduction:

Pandemics are large-scale outbreaks of infectious disease that can greatly increase morbidity and mortality over a wide geographic area and cause significant economic, social, and political disruption. Evidence suggests that the likelihood of pandemics has increased over the past century because of increased global travel and integration,



urbanization, changes in land use, and greater exploitation of the natural environment.

The Common Strategies for Mitigating the Effects of a Pandemic

- Pathogens with pandemic potential vary widely in the resources, capacities, and strategies required for mitigation. However, there are also common prerequisites for effective preparedness and response.
- The most cost-effective strategies for increasing pandemic preparedness, especially in resource-constrained settings, consist of investing to strengthen core public health infrastructure, including water and sanitation systems; increasing situational awareness; and rapidly extinguishing sparks that could lead to pandemics.
- Once a pandemic has started, a coordinated response should be implemented focusing on maintenance of situational awareness, public health messaging, reduction of transmission, and care for and treatment of the ill.
- Successful contingency planning and response require surge capacity—the ability to scale up the delivery of health interventions proportionately for the severity of the event, the pathogen, and the population at risk.
- For many poorly prepared countries, surge capacity likely will be delivered by foreign aid providers.
- This is a tenable strategy during localized outbreaks, but global surge capacity has limited that likely will be reached during a full-scale global pandemic as higher-capacity states focus on their own populations.
- Risk transfer mechanisms, such as risk pooling and sovereign-level catastrophe insurance, provide a viable option for managing pandemic risk.

THE ONGOING COVID PANDEMIC AS A CASE STUDY

- The coronavirus disease (COVID-19) pandemic has been particularly challenging for nursing home staff and residents.
- Centres for Medicare & Medicaid Services regulation waivers are burdening staff and affecting how care is delivered.
- Residents are experiencing social isolation, which can result in physical and behavioural health issues, particularly for persons with dementia.
- Addressing the impacts of the COVID-19 pandemic and resulting recession on the ECE sector will require that state, local, and tribal decision makers use available COVID-19 relief funds to mitigate those impacts while also laying the foundation for longer-term solutions.
- These challenges can be addressed in part through technology adaptations.



- Full integration of electronic health record systems can improve workflow and care quality.
- Telehealth can improve access to outside providers, provide remote monitoring, and improve social connectedness.
- Electronic and audio-visual programs can be used for end-of-life planning and information sharing between nursing home staff and families.
- Online learning systems and other online resources provide flexible options for staff education and training.
- Investing in and adapting technology can help mitigate workforce stress and improve the quality of nursing home care during and after the COVID-19 crisis.

Conclusion

Preparing for a pandemic is challenging because of a multitude of factors, many of which are unique among natural disasters. Pandemics are rare events, and the risk of occurrence is influenced by anthropogenic changes in the natural environment. Building pandemic situational awareness is complex, requiring coordination across bureaucracies, across the public and private sectors, and across disciplines with different training and different norms (including epidemiology, clinical medicine, logistics, and disaster response). However, an appropriately sized and trained health workforce (encompassing doctors, nurses, epidemiologists, veterinarians, laboratorians, and others) that is supported by adequate coordination systems is a fundamental need.

Q.13) The ongoing Ukrainian crisis has once again proven the significance of developing indigenous capabilities in defense technologies. Elucidate.

Approach

Candidates need to write about the self-reliant defense technology and highlight the significance of indigenous defense technologies how much it's important to avert Ukraine like crisis.

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 for example if Ukraine had defence capability it could deter from Russia.

Body

Significance 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 indigenous 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.

Conclusion

Indigenisation in defence is critical to national security also. It keeps intact the technological expertise and encourages spin-off technologies and innovation that often stem from it. Strategic Capability increases with self sufficient and self reliant defence industry also it will place India among the top global powers.



Q.14) With the help of suitable examples, discuss the applications of nanotechnology in the field of medicine.

Approach

Students are expected to write about the nanotechnology and simply write application of nanotechnology in the medicine field.

Introduction

Nanotechnology is science, engineering, and technology conducted at the nanoscale, which is about 1 to 100 nanometers. It is a field of research and innovation concerned with building 'things' – generally, materials and devices – on the scale of atoms and molecules.

Body

- **Drug delivery:** Nanomaterials have been introduced to the therapy of multiple diseases, including drug delivery system and nanodrugs. Drug delivery is one of the typical applicliposomes Nanomaterials in medicine. For example, tumor targeting, imaging and drug delivery can be accomplished by administrated gold nanoparticles and nanorods, iron oxide nanoworms and drug loaded liposomes.
- **Stem cells:** The application of nanotechnology has opened a new realm in the advance of regenerative medicine. The development of nanotechnology offers more opportunities of applying stem cells in the regeneration of tissues and organs.
- **Implantation:** Nanotechnology has also found applications in tissue and implant engineering. The possibility to enhance the surface area of the material and to tune the roughness of its surface at the nanometric scale should yield better biological responses of osteogenic cells and effective mechanical contact between tissue and implant.
- **Imaging** In vivo imaging is another area where tools and devices are being developed. Using nanoparticle contrast agents, images such as ultrasound and MRI have a favourable distribution and improved contrast.
- **Antibacterial treatment:** Researchers are developing a technique to kill bacteria using gold nanoparticles and infrared light. This method may lead to improved cleaning of instruments in hospital settings.
- **Medical Device:** Neuro-electronic interfacing is a visionary goal dealing with the construction of nanodevices that will permit computers to be joined and linked to the nervous system.



Conclusion

Advancement in the field of nanotechnology and its applications to the field of medicines and pharmaceuticals has revolutionized the twentieth century. A nanotechnology is a valuable tool for the prevention, diagnosis and treatment of human diseases. The medical area of nanoscience application has many projected benefits and is potentially valuable for all human races.

Q.15) What are gravitational waves? Why are scientists trying to detect gravitational waves? Discuss.

Approach-

Candidates need to explain gravitational waves and discuss why are scientists trying to detect them.

Introduction:

Albert Einstein suggested in 1916, that gravitational waves could be a natural outcome of his general theory of relativity, which says that very massive objects distort the fabric of time and space—an effect we perceive as gravity. But it wasn't until 2015 that the LIGO team directly detected gravitational waves, using a pair of ultra-sensitive detectors. The discovery ended a century of speculation and confirmed Einstein's original prediction. Accordingly, very massive objects spiralling toward each other should wrinkle space-time and send those distortions across the cosmos, like ripples spreading across a pond at the speed of light.

What are gravitational waves?

- Gravitational waves are ripples in the otherwise tough, stiff fabric of spacetime produced by the most violent phenomena the cosmos can offer—things like exploding stars and collisions between ultra-dense neutron stars or merging black holes.
- In essence, gravitational waves “are propagating disturbances of the shape of spacetime.
- Gravitational waves are washing over Earth all the time, but instruments have not been sensitive enough to detect them until very recently.

Why are scientists trying to detect gravitational waves?



- Since LIGO's first detection of the gravitational waves, we've gained unexpected insight into the cosmos. That's because gravitational waves are a new way of "seeing" what happens in space: We can now detect events that would otherwise leave little to no observable light, like black hole collisions.
- With the detection, astronomers were able to combine gravitational waves with more traditional ways of seeing the universe, helping to untangle mysteries about the dense, dead objects known as neutron stars.
- LIGO has opened a new 'window' on the universe. Things like colliding black holes are utterly invisible to EM astronomers. To LIGO, such events are beacons in the vast cosmic sea.
- More importantly, since gravitational waves interact very weakly with matter (unlike EM radiation, which can be absorbed, reflected, refracted, or bent), they travel through the Universe virtually unimpeded, giving us a clear view of the gravitational-wave Universe. The waves carry information about their origins that is free of the distortions or alterations suffered by EM radiation as it traverses intergalactic space.
- The gravitational waves that LIGO detects are caused by some of the most energetic events in the Universe—colliding black holes, merging neutron stars, exploding stars, and possibly even the birth of the Universe itself.
- Detecting and analysing the information carried by gravitational waves is allowing us to observe the Universe in a way never before possible, providing astronomers and other scientists with their first glimpses of literally unseeable wonders.
- LIGO has removed a veil of mystery on the Universe and in so doing, has ushered in exciting new research in physics, astronomy, and astrophysics.

Conclusion

The first detection of gravitational waves was a very important event in science. Before this, just about everything we knew about the universe came from studying waves of light. Now we have a new way to learn about the universe—by studying waves of gravity. Gravitational waves will help us learn many new things about our universe. We may also learn more about gravity itself.



Q.16) What is virtual reality? What are its applications? In this light, examine the significance of Metaverse.

Approach-

Candidates need to write about the virtual reality and how it has several application. Also highlight and examine the virtual reality in the light of metaverse.

Introduction

Virtual Reality (VR) is a computer-generated environment with scenes and objects that appear to be real, making the user feel they are immersed in their surroundings. This environment is perceived through a device known as a Virtual Reality headset or helmet.

Body

Application of virtual reality:

- The first thing which comes to our mind when we think about VR is gaming, but applications of VR are not limited to just gaming.
- We are using this technology in the field of military, healthcare, education, fashion, business, sports, media, engineering, entertainment, scientific visualization, architecture, among others.
- For example in Education sector has adopted VR for teaching and learning situations. It has the potential to revolutionise learning, retention and content delivery exponentially.
- For example in military It is used to train soldiers in a simulated battlefield. This gives soldiers the opportunity to learn without the risk of being killed or injured.
- Also in engineering and architecture VR plays a major role in simulating 3-dimensional models or designs of infrastructures, which can provide a real-life experience of the physical designs of infrastructures beforehand. With the help of VR, cars, machines, aeroplanes etc. Can be virtually designed and pretested for factors.

Metaverse with VR:



- Metaverse is the next version of the Internet focused on social connection. It can be defined as a simulated digital environment that uses Virtual Reality (VR), along with concepts from social media, to create spaces for rich user interaction mimicking the real world.
- It can be imagined as a 3D virtual world, with ever-evolving aspects which are collectively shared by its inhabitants – a virtual world with real-time events and an online infrastructure.
- Virtual communities, activities, events, all seamlessly accessible without the need to sign into multiple apps.
- One can sign into his virtual office with metaverse as a virtual avatar of himself, meet a client, take a break or play a sport – virtually all in one place.

Conclusion

Technology of meta verse is still evolving it could also lead to new scrutiny of old issues like privacy and managing who does what to whom in a virtual world. The government's involvement in Metaverse is also a significant aspect as it may change the whole dynamic of the virtual spaces. Therefore requirement of preparatory infrastructure is needed for the transition to a digital economy and to the metaverse.

Q.17) What is the meaning and significance of Ct Value in an RTPCR test? Explain.

Approach

Students are expected to write about the Ct value it's meaning and significance in the test of RT PCR.

Introduction

Among various scientific terms that the Covid-19 pandemic has made part of the public vocabulary, one is the 'Ct value' in RT-PCR tests for determining whether a patient is positive for Covid-19.

Body

Meaning:

- According to the ICMR advisory, the Ct value of an RT-PCR reaction is the number of cycles at which fluorescence of the PCR product is detectable over and above the background signal.



- Put simply, the Ct value refers to the number of cycles after which the virus can be detected.

Significance:

- According to the ICMR, a patient is considered Covid-positive if the Ct value is below 35. In other words, if the virus is detectable after 35 cycles or earlier, then the patient is considered positive.
- If the benchmark were to be lowered to 24 the value mentioned by state of Maharashtra it would mean that Ct values in the range 25-34 would not be considered positive.
- Ct value determines the detectable level of the virus in a given sample based on which it is decided if the person is COVID positive or negative.
- A benchmark of 35, therefore, means that more patients would be considered positive than we would get if the benchmark were 24.
- The ICMR has said lowering Ct threshold parameter may lead to missing several infectious persons.
- One can think of Ct value as a measure of transmission potential. So if there is more virus in my throat and nose, I will transmit it better.
- Although Ct value is inversely correlated with viral load, It does not have any bearing on the severity of the disease, experts have said.
- A patient can have a low Ct value, which means her viral load is high enough to be detected rapidly, but she may still be asymptomatic.
- The Ct value tells us about the viral load in the throat and not in the lungs.

Conclusion

While whether Ct value alone can determine the risks, severity and infection level in an individual still remains debatable, many clinicians, researchers consider it as one of the many parameters that hold potential in determining the dynamics of the infection and in efforts to control the transmission.

Q.18) What is quantum key distribution technology? What can be its possible applications? Discuss.

Approach

Candidates need to write about the quantum key distribution technology and discuss about its possible applications.

Introduction



The concept of quantum key distribution (QKD) was first proposed in the 1970s. The idea was incredibly simple yet it still took until the 1990s, when the connection was made to entanglement, that physicists started to get really interested. Since then, the progress has been remarkable and it is now perhaps the most mature quantum technology, being commercially available for over 15 years now.

Quantum key distribution technology

Quantum Key Distribution (QKD), also known as Quantum Cryptography, is a mechanism for developing secure communication. It enables the distribution and sharing of secret keys, which are necessary for cryptographic protocols. The conventional cryptosystems used for data-encryption rely on the complexity of mathematical algorithms, whereas the security offered by quantum communication is based on the laws of Physics.

Applications of quantum key distribution technology

- The whole responsibility of QKD networks is to transfer keys between parties who wish to communicate securely.
- QKD is essential to address the threat that rapid advancement in Quantum Computing poses to the security of the data being transported by various critical sectors through the current communication networks.
- There will be applications where QKD is ideal – replacing trusted couriers, for example – and others where the benefits are not so clear – e.g., CNP and online banking, which need a huge quantum ATM infrastructure to allow it to work, but get added security as a result. Business decisions are never easy.
- It is especially good at creating long random keys from a short input – key extension functionality which could be invaluable for OTPs.
- The technology would be useful in enabling various start-ups and small and medium enterprises in the domain of quantum information.
- It will enable security agencies to plan a suitable quantum communication network with indigenous technology backbone.

Conclusion

The power of start-ups and Big Tech corporations involved in developing quantum technology and applications must be harnessed. The focus should be to develop an overarching strategy for the next 10-15 years. The strategy must ensure that there is no misallocation of resources and that the efforts put in are concentrated in key areas that provide both economic and strategic benefits.



Q.19) What is the Starlink internet venture? How is different from other internet services? Discuss.

Approach-

Candidates need to write about the starlink internet services how it works and how it's different from the other internet service.

Introduction

Starlink is a SpaceX project to build a broadband network with a cluster of orbiting spacecraft that could eventually number thousands. Starlink currently has 1,385 satellites in orbit and has already started beta testing in North America and initiating pre-orders in countries like India.

Body

Difference from other internet services:

- **Space Infrastructure:** Satellite Internet is the technology that beams the internet down from a satellite that's orbiting the earth. It will use geostationary (GEO) and medium earth orbit (MEO) satellites, while Starlink and OneWeb use low earth orbit (LEO) satellites.
- **As LEO satellites orbit closer to the earth, they are able to provide stronger signals and faster speeds than traditional fixed-satellite systems.**
- **Latency:** The service offers low-latency broadband internet to remote areas across the globe, using a constellation of satellites in low-Earth orbit. Will help to bring the lag down to 20-30 milliseconds, roughly the time it takes for terrestrial systems to transfer data.
- **Speed difference:** The premium service of starlink claims to provide internet speeds ranging between 150 and 500 mbps. The latency of the premium service is between 20-40ms.
- **Duration and accessible difference:** According to Starlink's website, the premium offering will come with 24x7 support and assist features through a mobile app. In other words, it allows users to connect to the internet beamed from space onto a dish antenna, much like satellite TV.
- **Coverage area difference:** The reason telecom firms want to explore satellite internet is that there are areas where fibre connections just can't reach. Hence, satellite networks are being used to bring connectivity to such areas, which include hills and remote islands.



- Easier Connectivity: As satellites appear to be stationary, it is easier to link to them.

Conclusion

While in the short term satellite broadband may only be targeted at remote areas where terrestrial networks haven't reached, in the longer term it could end up competing with these networks even in the developed regions given one key benefit, which is that signals travel faster through space than they do through optic fibre cables.

Q.20) What is the Kavach train protection system? How does it work? Explain.

Approach

Students are expected to write about the Kavach the train protection scheme recently announced in budget explain how it work and it's benefits.

Introduction

The Kavach system was announced in the 2022 Union Budget as a part of the Atmanirbhar Bharat initiative. Around 2,000 km of rail network is planned to be brought under the indigenous system to enable safety and capacity augmentation in 2022-23.

Body

Causes of rail accidents in India:

- Derailments
- Failure of railway staff
- Unmanned level crossings (UMLCs)
- Congestion
- Collisions- Due to foggy weather, low signal visibility, poor signaling etc.

Recently, the Indian Railways tested 'Kavach'-Automatic Train Protection System by making two trains move towards each other at full speed.

Kavach train protection scheme:



- It is India's very own automatic protection system in development since 2012, under the name Train Collision Avoidance System (TCAS), which got rechristened to Kavach or "armour".
- Simply put, it is a set of electronic devices and Radio Frequency Identification devices installed in locomotives, in the signalling system as well the tracks that talk to each other using ultra high radio frequencies to control the brakes of trains and also alert drivers, all based on the logic programmed into them.
- It continuously refresh the movement information of a train, it is able to send out triggers when a loco pilot jumps signal, called Signal Passed at Danger (SPAD), a grave offence in railway operations with respect to safety, and the key to accidents like collision.
- The devices also continuously relay the signals ahead to the locomotive, making it useful for loco pilots in low visibility, especially during dense fog.
- TCAS or Kavach includes the key elements from already existing, and tried and tested systems like the European Train Protection and Warning System, and the indigenous Anti Collision Device.
- The current form of Kavach adheres to the highest level of safety and reliability standard called Safety Integrity Level 4.
- It will also include stationary equipment to gather signalling inputs and relay them to a central system to enable seamless communication with the train crew and stations.
- Over 13,000 train accidents in 2020, 32 lives lost daily on average as per NCRB report. With this type of protection system trains collision with other train can be reduced.

Conclusion

Train accidents cause loss of life and property as well as are detrimental for the economy. Preventing their occurrence with generational change in rail system with technological up gradation will ensure not just safety of lives but will also be beneficial for the economy as a whole and fulfill mission zero accident 2016-17.

Q.21) What are thermobaric weapons? How do they function? Explain.

Approach-

Candidates need to write about the thermobaric weapons and explain how they function.



Introduction

Fears have risen over the use of thermobaric weapons by Russia after the Ukrainian ambassador to the US said a vacuum bomb – another term for the weapon – had been used during the invasion. These weapons have been used by Russian and western forces since the 1960s. The US relied on them in its attempts to eliminate al-Qaida in the mountains in Afghanistan.

Thermobaric Weapons

- The thermobaric weapon, also known as an aerosol bomb or fuel air explosive, is a two-stage munition.
- These weapon suck in oxygen from the surrounding air to generate a high-temperature explosion and are effective at their “specific purpose” of “primarily destroying defensive positions”.
- While they would not be used to penetrate a tank, they could be a very destructive weapon against an apartment complex or other building.
- They are not illegal even though their effects can be pretty horrific, because of that effect of creating a vacuum and sucking the air out of the lungs of defenders.

How the Thermobaric Weapons Function

- The first-stage charge distributes an aerosol made up of very fine material – from a carbon-based fuel to tiny metal particles.
- A second charge ignites that cloud, creating a fireball, a huge shock wave, and a vacuum as it sucks up all surrounding oxygen.
- The blast wave can last for significantly longer than a conventional explosive and is capable of vaporising human bodies.
- Such weapons are used for a variety of purposes and come in a range of sizes. They are often used in a “bunker-buster” role to destroy defensive positions. Extremely large, air-launched versions are designed to destroy caves and tunnel complexes.

Conclusion

One of the things we know about Russian tactics is that they are willing to destroy everything. It's clear that the Ukrainians are hunkering down in some of the cities as



that continues the Russians are going to resort more and more to using whatever weapons they have including thermobaric weapons in built-up urban areas.

Q.22) What are the challenges faced by India's civil aviation sector? Do a causal analysis.

Approach-

Candidates need to write about the Indian civil aviation sector and its significance also highlight the challenges of civil aviation in India.

Introduction

The civil aviation industry in India has emerged as one of the fastest growing industries in the country during the last three years. India has become the third largest domestic aviation market in the world and is expected to overtake UK to become the third largest air passenger market by 2024.

Body

Significance of aviation sector in India

- **Contributes to GDP:** The Aviation sector in India currently contributes \$72 bn to GDP
- **Job creation:** Indian aviation sector to employ 4 million by 2035.
- **Allied Sector Growth:** Before COVID-19, Maintenance, Repair & Overhaul (MRO) industry was forecasted to grow at an expected 5 year CAGR of close to 10% by 2023
- **Regional Connectivity:** It boosts connectivity to smaller cities and north-eastern states.

Challenges of Indian Aviation Sector

- **Infrastructure deficit:** unavailability of land to expand airports at their current sites, particularly in major cities
- **High Fuel Costs:** Fuel cost as a percentage of operating charges amounts to 45% in India as compared to the global average of 30 per cent.
- **Procedural Complexities:** Taxes and approvals by both Central and States governments increases the transaction costs of the aviation sector



- Inadequate Human Resource Capabilities: Shortage and gaps in the availability of industry-recognised skills – from airline pilots and crew to maintenance and ground handling personnel – constrains the growth of different segments of the sector.
- Weak MRO sector: 90% of the Indian MRO work is outsourced to countries like Singapore, Dubai, UAE, Sri Lanka and others.

Conclusion

India needs relaxation in some harsh regulatory measures and liberalisation policy for exit of an airline. With more private sector investment, tier II and tier III cities will also see new infrastructure development as envisaged in civil aviation policy of 2016.

Q.23) Examine the key factors that have contributed to India's coal crisis? Suggest a roadmap to address this crisis.

Approach

Students are expected to write about the recent coal crisis in India with highlighting the factors responsible for it and then suggest some measures.

Introduction

According to International Energy Agency (IEA), coal-generated power plant account for around 70 percent of India's electricity generation. As eighty percent of India's 135 coal-powered plants had less than 8 days of supplies left more than half of those had stocks worth two days or fewer.

Body

Considering the limited reserve potentiality of petroleum & natural gas, eco Conservation restriction on hydel project and geo-political perception of nuclear Power, coal will continue to occupy centre-stage of India's energy scenario we need to study the challenges associated with coal sector:

- Recent crisis due to excessive rainfall, international price rise, Covid-19 pandemic, less production, transportation issues including freight rates and high consumption were the reason for the coal shortage.



- In the first eight months of 2021, India's power demand rose by 13.2 percent after a decline for the first time in over three decades in 2020.
- Being the world's third largest coal importer, India's imported supplies have shrunk by an unprecedented 44 percent
- In era of rising competition from the renewable energy and fossil fuel related climate politics thermal power plants possess the challenges of commercialization of coal stock and reserves.
- Default in payments by power plants or generating companies to Coal India forced the miner to go slow on deliveries to those with large outstanding.
- The coal sector has low productivity. The use of unscientific mining methods is a major contributor.
- The delay in clearance for mining coal impedes the realisation of the reserves' actual potential.
- The sector requires high operational and maintenance cost.

Measures:

- Entrance of private players in the sector will improve the coal quality and supply.
- Coal gasification is one of the technology that can be potentially used. It is the conversion of coal into syngas which can be used for power generation.
- Government support for the early resolution in land acquisition-related issues is needed to ensure timely operationalisation of coal mines.
- Improving the productivity of the sector is lucrative only in the short term. There is an inescapable need to understand the fact that it is a major contributor to climate change and our economy must gradually shift to renewables.

Conclusion

There is a need to encourage development and deploy technologies which involve extraction, transportation and burning of the black gold in the most efficient and environment friendly manner. R&D is necessary for improving the sector's efficiency. Simultaneously, training and awareness programs are needed for information dissemination.



Q.24) What are the challenges of infrastructure financing in India? Do you think the current investment models are effective in addressing those? Critically comment.

Approach-

Candidates need to write about the challenges of infrastructure financing in India. Also, the candidate needs to critically the current what he thinks about effectiveness of investment models in addressing those challenges.

Introduction

Infrastructure development involves huge investments, procedural delays and returns spread over a long period of time. These unique features of infrastructure development raise some issues which are specific to the financing of infrastructure. As a result, mobilising and structuring financing for infrastructure development is a complex proposition.

The Challenges of Infrastructure Financing in India

- India has infrastructure challenges. Poverty and density may make these issues more pronounced than in many other countries, but the underlying question is always the same.
- The corporate bond market is still a long way to go in providing adequate financing to the infrastructure sector in India.
- Issues relating to land acquisition and environmental clearances add uncertainty which affects the risk appetite of investors as well as banks.
- Infrastructure is an economic enabler, not a panacea. It is the sum of many physical interdependencies that make up the essential services that a government provides.
- These services do not create an economy; they facilitate one. Infrastructure needs to make people more efficient so that they can be more productive with their time.
- Almost half of the total investment in the infrastructure sector is done by the Government through budget allocations. But Government funds have competing demands, such as, education, health, employment generation, among others.
- Commercial banking sector's ability to extend long-term loans to the infrastructure sector is limited.

Current Investment Models Are Effective in Addressing the Challenges of Infrastructure Financing in India



- India's private sector also needs to change some of its practices, as aggressive bidding and inadequate liquidity drive construction contractors to excessively rely on loan financing.
- Construction margins are tight everywhere in the world, but contractors in markets with a healthy secondary market for infrastructure assets are able to recycle their capital quicker, as infrastructure funds and even institutional investors actively buy up operating assets.
- These markets take time to develop, but the Indian government can begin laying the foundation for such activity now with effective regulatory reform to create a more attractive market.
- Drawn-out dispute resolution and land-acquisition processes are other long-standing issues in India.
- Delayed environment clearances continue to stall projects despite the passing in 2013 of a Land Acquisition, Rehabilitation and Resettlement Act (LARR).
- After 2014, the government had its sights set on reforming LARR to remove public consent clauses and social impact assessment requirements if land is acquired for national security, defence, and rural and social infrastructure.
- Whatever reforms India settles on – a transparent, consistent and stable land-acquisition process is essential for a healthy infrastructure market.
- India has a young, well-educated and skilled workforce. In addition, the outsourcing of professional services to India from multinationals and companies based all over the world have brought global best practice to India, which can be exported at cost-effective rates.
- As India's young generation matures, the opportunity for Indian businesses to capitalize on this resource and push beyond India's borders has never been greater.

Conclusion

This is where India meets its fork in the road. In one direction is business as usual, where India feels and acts like a world in and of itself. The other direction leads to more global engagement. One path is safe – but incredibly congested. The other is bolder and more competitive – but also liberating as its infrastructure market accelerates to match the tenacity of India's economic potential.



Q.25) Do you think the policy of self-reliance in the form of 'Atmanirbhar Bharat' reconciles with the reality of globalisation? Critically analyse.

Approach-

Candidates need to write about the idea of self reliance with respect to policy of atmanirbhar bharat and critically analyse how it's reconciling with globalized order and globalisation.

Introduction

It is important, at the very onset, to clarify that this idea of self-reliance is not about a return to Nehruvian import substitution or autarkic isolationism. The prime minister modi emphasised that his vision includes active participation in post-COVID global supply chains as well as the need to attract foreign direct investment.

Body

Atmanirbhar bharat policy raising question over globalisation:

- India has been one of the major beneficiaries of economic globalisation — a fact attested by IMF.
- Similarly, in times of globalisation and being governed by the rules of the WTO, any efforts at creating systemic impediments to the smooth flow of trade across nations on trivial nationalism parameters are surely going to backfire, one way or the other.
- Such a stance may have a recoil effect on India's foreign trade too. The EIU said that a more protectionist trade stance and any increase in tariff rates for imports may lead to punitive tariffs or the revocation of trade benefits from its partners.
- India is dependent on China for imports related to electronics, solar equipment, pharmaceutical (Active pharmaceutical ingredients) and Capital goods.
- Without developing domestic capacity for manufacturing in these areas, breaking away from dependence on China would not be easy.

Self-reliance implies that product and factor markets are made flexible in order to allow the Indian economy to adapt to the problems and opportunities of an emerging post-COVID world:



- A significant part of the economic dimension of “Atmanirbhar Bharat” is on increasing the competitiveness of Indian production and building connections to global value chains (GVCs).
- This implies a need to turn away from protectionist policies, while using the lessons from new industrial and trade policy.
- To achieve real self-reliance, we are incentivising innovation, research and development to keep India at the cutting edge of the industry which come in line international trade.
- It is not protectionism. It is not inward looking. It is not just import substitution and it is not economic nationalism. Main philosophy is to make India self-reliant by creating an eco-system that will allow Indian companies to be highly competitive on the global stage.

Conclusion

The Self-Reliance neither signifies any exclusionary or isolationist strategies but involves creation of a helping hand to the whole world it's about being vocal for “local” which is a key complement of Atma-Nirbhar Bharat Abhiyan. In this context, people must internalise the concept of valuing local products and artefacts and promoting them. Only after this the dream of transforming “Local” India into a “Glocal” India will be possible.

Q.26) What are the pressing challenges faced by the MSME sector in India? What recent measures have been taken by the government to strengthen the MSMEs? Discuss.

Approach

Students are expected to write about the MSME and challenges faced by the sector as question demands also write about recent measures taken by government to solve problems.

Introduction

Micro small and medium enterprises (MSMEs) have always been vital in the socio-Economic development of India. Spread across both urban and rural areas, MSMEs



Produce a diverse range of products and services and provide large-scale employment at low capital cost.

Body

- MSME sector is facing challenges and does not get the required support from the concerned Government Departments, Banks, Financial Institutions and Corporates which is proving to be a hurdle in the growth path of the MSMEs.
- Limited capital and knowledge and non-availability of suitable technology are few critical issues in this sector.
- Ineffective marketing strategy, Constraints on modernization & expansions and non-availability of skilled labour at affordable cost are few other concerns surrounding the sector.
- India's formal MSME involves a regulatory burden of 60,000+ compliance items, 3,300+ annual filings, and 6,000 changes every year.

Measures:

- Credit Guarantee Scheme for Micro & Small Enterprises (CGTMSE): The scheme aims at motivating first generation entrepreneurs towards self-employment by providing credit guarantee funding for third-party guarantee-free / collateral free loans.
- Atma-nirbhar Bharat Abhiyaan: Rs 3 lakh crore collateral-free automatic loans for MSMEs. Rs 50,000 crore equity infusion through MSME Fund of Funds.
- Udyami Mitra Portal: launched by SIDBI to improve accessibility of credit and handholding services to MSMEs.
- MSME Sambandh: To monitor the implementation of the public procurement from MSMEs by Central Public Sector Enterprises.
- MSME Samadhaan: MSME Delayed Payment Portal — will empower Micro and Small entrepreneurs across the country to directly register their cases relating to delayed payments by Central Ministries/Departments/CPSEs/State Governments.

Conclusion

This scheme will bring a positive impact on the economy and will mitigate the distress caused by the Corona pandemic. Further to make it more impactful the government and RBI should work together to address the issues highlighted by the msme sector for better uptake of the scheme across the sector.



Q.27) How does international crises affect the equity market? Examine in the light of the ongoing Ukraine crisis.

Approach-

Candidates need to write about the journalistic ethics and how objectivity will be important pillar of it is to be addressed with substantiating views.

Introduction

Brent crude prices hit \$96.7 per barrel on Tuesday, the highest mark since September 2014, following Russian President Vladimir Putin's deployment of troops to separatist areas Donetsk and Luhansk in Ukraine. While the West has termed it a blatant violation of international law, the rising global tensions and threat of invasion in Ukraine have caused oil prices to surge and the stock markets to crash. The spike has been driven primarily by fears of supply side disruptions as the threat of Russian invasion in Ukraine looms large following Putin's deployment of troops to separatist areas Donetsk and Luhansk.

International Crises Effect on The Equity Market

- Ukrainian bonds just got very cheap relative to history. Ukraine bonds collapsed following Russia's invasion.
- A Russian invasion of Ukraine could not only disrupt crude supplies globally, but also lead to sanctions by the US and Europe.
- Oil prices have been rising over the last couple of months on concerns over supply, following tensions between Russia, the world's second-largest oil producer, and Ukraine.
- Ukraine bonds reflect the fact of the invasion, but not the likelihood of new international support. The impact of sanctions imposed on top personnel, directly involved companies and financial institutions on emerging markets equity will be similar to what was outlined above for emerging markets debt.
- While banks have indicated that they have a back-up plan in place from being excluded from SWIFT, the uncertainty may mean a greater initial impact.
- While secondary market sanctions are more likely to impact debt securities than equities, we certainly can't rule out equity holdings, which may lead to potential forced selling.



- Ukraine is expected to enter the J.P. Morgan GBI-EM Global Core Index at the end of March, and given the fluidity of the situation, any impact to liquidity bears watching.
- We expect that the index provider, J.P. Morgan, will continue to assess Ukraine's eligibility up until the expected inclusion date.
- Any additional rounds of sanctions will likely be stronger, but we believe they will focus on the same targets: sovereign, state owned entities (especially banks), strategic industries and individuals.
- Any sanctions that result in the inability to transact in Russia related bonds (including those already issued and outstanding) will lead to the removal of those bonds, or the country, from emerging market debt indices.
- Our emerging markets debt ETFs are passively managed, so allocation shifts will be in response to any changes made by the indexers.
- The impact of sanctions imposed on top personnel, directly involved companies and financial institutions on emerging markets equity will be similar to what was outlined above for emerging markets debt.
- While banks have indicated that they have a back-up plan in place from being excluded from SWIFT, the uncertainty may mean a greater initial impact.
- While secondary market sanctions are more likely to impact debt securities than equities, we certainly can't rule out equity holdings, which may lead to potential forced selling.
- Our Emerging Markets Equity Strategy has some Russian exposure, but this is concentrated in companies which are domestic oriented and can fund and their growth plans entirely out of internally generated cashflow.
- We are in a very fluid situation and we are constantly re-assessing risk. While certainly not immune, Russian companies, we believe, are generally better insulated against potential external events than in 2014.
- The Russian equity market is currently trading at a steep discount even to its own history, despite the benefit of elevated commodity prices.
- Now that the Russia-Ukraine war is looking like the worst possible case, markets are reflecting the rising commodity supply risks. Ukraine and Russia together are critical supply sources for several very important commodities.
- Together, Russia and Ukraine are the major suppliers of wheat, sunflower oil and fertilizers to Europe and the Middle East.
- Additionally, the record prices in Europe for natural gas and electricity are shutting down fertilizer and aluminium production. Russia is also a very important producer of aluminium, nickel and palladium.
- All of these commodities were in short supply before the war, and in the near term, we believe there is no easy fix to the supply shortages.



- As safe haven assets, we believe gold and gold stocks stand to gain the most from the Russian invasion of Ukraine.
- This conflict has raised risks globally as hostilities in other parts of the world may also escalate. U.S. sanctions on Russia have driven energy prices higher, further increasing inflationary pressures.

Conclusion

We have already positioned our Gold Strategy for stronger gold prices that we expect to be driven by inflation and the risks to the economy and markets posed by the coming U.S. Federal Reserve rate hiking cycle. The Strategy is fully invested in gold mining stocks, thereby potentially achieving leverage to gold price gains.

Q.28) Do a brief critical evaluation of RBI's monetary policy during the pandemic.

Approach-

Candidates need to write about the important role of RBI during pandemic. Then simply critically evaluate the monetary policy.

Introduction-

Monetary policy refers to the policy of the central bank – ie Reserve Bank of India – in matters of interest rates, money supply and availability of credit. RBI uses various monetary instruments like REPO rate, Reverse RERO rate, SLR, CRR etc to achieve its purpose.

Body

- As the monetary authority, the Monetary Policy Committee (MPC) laid a triple objective of mitigating negative effects of the virus, reviving growth and preserving financial stability.
- To ease economic hardship while keeping inflation in check, the RBI slashed interest rates keeping the policy repo rate at a low of 4%.
- The cash reserve ratio (CRR) was lowered, which provided additional liquidity to help aid banking system.
- The goal was to ensure that no part of the financial system faced liquidity concerns or credit constraints.



- To ensure that governments did not have to cut their spending due to shortfalls in revenue, RBI needed to enable both central and state government to borrow adequately in debt markets.
- RBI purchased about 30% of central government's net market borrowings in FY 2021 and has committed to continue to purchase substantial amounts in FY 2022 through the G-sec Acquisition Programme.

Critical evaluation of Monetary policy functions of RBI:

- Supply chain disruptions: The MPC uses CPI inflation to adjust its policy rates. However, the CPI doesn't factor the rise in inflation driven by supply-chain dislocations. For example, restriction on movement resulted into a shortage of essentials.
- Informal Indian economy: The monetary policy affects only around 60% of loans/credit in the Indian economy which are sourced from formal channels (Banks and NBFCs).
- Weak policy transmission: Both the government and the RBI are concerned that the cumulative easing has not yet been reflected in the lowering of their lending rates by banks.
- Limitation of Inflation targeting: Inflation has been accompanied by declining borrowing in the formal sector likely affecting investment leading to rise in unemployment (according to NSSO, unemployment in India has been highest in the last 45 years).
- Triangular balance-sheet: In the aftermath of the IL&FS default in 2018, an additional dimension of liquidity and solvency of the NBFC sector has been added to the prevailing twin balance-sheet problem. Borrowing easy money cannot solve governance issues.
- Gold economy: The Indian household saves in gold/jewelry rather than financial instruments. This curtails RBI from effectively circulating money in the economy.

Way forward:

- Develop a legal process to ascertain RBI's responsibilities and accountability.
- Ensuring RBI's autonomy: The governor should be made responsible and accountable to Parliament. The RBI act should be amended to provide a guaranteed tenure of the governor and deputy governors for their effective functioning.

Conclusion



There is need to look at an indicator of inflation that excludes food and fuel and include structural factors responsible for price rise. Also there should be mutual cooperation and coordination between RBI and Government in large at public interests for an efficient and sustainable economy.

Q.29) The formal sector alone can't meet the demand for employment. Do you agree? What are the challenges with the informal economy when it comes to employment generation?

Approach

Students are expected to write about the background of Indian workforce in introduction. Highlight how formal sector is driver the growth but it will be informal sector to spur Indian growth. Write challenges of informal economy for creation of employment.

Introduction

In developing countries like India, as per ILO large share of the population typically depends upon the informal economy. The economic growth and development in general and livelihood and wages in particular of the vast majority of workers in India crucially depend on the economic viability of the informal sectors.

Body

- Formal sector are likely to be an important near term driver of growth. India's global market share of services has continued to rise, revealing a growing comparative advantage.
- With the pandemic likely to provide a renewed thrust to off-shoring of formal sector in India must stand ready to grab the opportunity, from both a regulatory and supply perspective.
- According to Periodic Labour Force Survey – Over 90 percent of workers in India are informal workers. Therefore informal sector will be vital to India's growth prospects over the next decade.
- It is time to use the opportunity that the informal sector provides to strengthen and support it. This is not only essential for economic growth but the only way for growth with jobs.

Challenges in the Informal Economy for generation of employment:



- **Issues of Exclusion:** While on paper, the draft rules envisage wider coverage through the inclusion of informal sector and gig workers, at present the draft rules apply to manufacturing firms with over 299 workers. This leaves 71 per cent of manufacturing companies out of its purview.
- **Burden of Administrative Processes:** The draft rules mandate the registration of all workers (with Aadhaar cards) on the Shram Suvidha Portal to be able to receive any form of social security benefit. Failure to register (Aadhar –driven exclusion or lack of adequate knowledge about process) will make them ineligible for the benefits. Also, migrant workers face the challenge of mandatory updating information on the online portal at regular intervals.
- **Ambiguity on applicability of benefits:** It is unclear if a migrant worker with an Aadhaar card registered in her/his home state of Bihar be eligible for social security benefits in Gujarat where she/he is currently employed.
- **No-Right Based Framework:** The Code does not emphasize social security as a right, nor does it make reference to its provision as stipulated by the Constitution. In addition, it does not stipulate any appropriate grievance redressal mechanism which will leave millions of workers vulnerable without clear social protections.

Way Forward

- Upgrade the skills of those who are already in the informal sector with government support through easier access to credit, technology and availability of markets.
- A social security architecture to be provided by the government for informal sector workers.
- Less of regulation and more of support as against the government policy of more regulation and no support.
- Any attempt to regulate and bring the informal sector into the tax network will only add to costs without increasing productivity.
- Creating an eco-system to improve competitiveness and boost exports more broadly will be vital to India's growth prospects over the next decade.

Q.30) How do household savings benefit the economy? Explain. What measures can be taken to promote savings? Discuss.

Approach-



Candidates need to critically comment about how do household savings benefit the economy. The candidate needs to mention the measures that can be taken to promote savings.

Introduction:

In economics, household savings refer to money left after the household pays taxes and spends on the consumption of goods and services. It is vital for the economy's long-term growth as it is the primary source of domestic loanable funds, besides savings from business and public sectors.

How do household savings benefit the economy?

- Household savings are a supply source of domestic funds for capital investment. Households save their money into various types of assets, such as deposits, stocks, and bonds.
- An increase in household consumption drives up aggregate demand stimulates a growing real GDP. Savings also become a pillow when times are hard.
- In return, they receive interest income, dividends, or capital gains. On the other side, to increase production, the companies require money to purchase new equipment and other capital assets.
- They then raise funds, for instance, by issuing bonds. Supply-demand of the money takes place in the financial market.
- By saving, households sacrifice current consumption for future consumption.
- For this reason, saving allows households to support their well-being.
- As the household invests in the corporate bonds, money flowing to the business sector.
- Now, with money, companies can invest and increase their productive capacity.
- Investment in capital assets is essential for economic growth.
- It is a key driver in increasing the productive capacity of the economy. Higher production capacity leads the economy to produce more goods and services, without causing inflationary pressures.
- In the capital markets, the money moves from household sectors to the business sector, for instance, through investing it into corporate debts or stocks. Companies can use it to funds capital investment. For this reason, household savings are essential to increase the productive capacity of business sectors.
- Savings also allow households to accumulate wealth. In addition to income, wealth is a crucial determinant for consumption.



Measures That Can Be Taken to Promote Savings

- **Minimizing Fixed Expenses:** Many people get locked into their lifestyle due to long-term contracts and debt. The more of this you can avoid and eliminate, the easier it is to change your budget each month in response to changes in income.
- **Track Your Savings Rate:** everyone should calculate it at least once a year. The mere act of doing so will subconsciously cause you to increase it.
- **Watch the Credit Cards:** You may be amazed at how much less you spend when you have to hand over cold, hard cash, not to mention take the time to go get it. This effect is likely higher than any 1-5% rewards you may be getting back for using the card.
- **Minimize Taxes by Maximizing Tax-Deferred Retirement Accounts:** One of the best ways to increase that savings rate is to use tax-deferred retirement accounts

Conclusion:

The savings rate shows how much households save their income rather than being consumed for goods and services. Hence On both personal and a national-level, maintaining a solid household savings rate is one of the best cures for economic woes.

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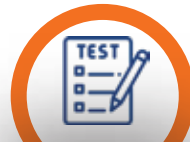


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