INSTA SECURE SYNOPSIS
MAINS MISSION - 2022

GS-III

JANUARY 2022
NOTE: Please remember that following ‘answers’ are NOT ‘model answers’. They are NOT synopsis too if we go by definition of the term. What we are providing is content that both meets demand of the question and at the same time gives you extra points in the form of background information.

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Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

Do you agree that the Indian economy has recently experienced V-shaped recovery? Give reasons in support of your answer. (250 words)

**Difficulty level:** Moderate  
**Reference:** Indian Express  

**Why the question:**  
The question was asked just a day ago in UPSC Mains GS3.  

**Key Demand of the question:**  
Highlight the reasons for the argument that India has recovered from the economic slowdown.  

**Structure of the answer:**  
**Introduction:**  
Begin by defining what is V-shaped recovery  

**Body:**  
Give data and draw a graph to show that India has had a V-shaped recovery after the Impact of COVID19 in the years 2020 and 2021.  
However, also point out that the recovery may be temporary, in the absence of government policy support and rising consumer demand. Also, the impact of resurging COVID may dampen the growth further.  
Suggest a few steps that India can take to mitigate the impact of COVID and ensure growth in the economy.  

For further reference: Business Standard, IndiaToday  

**Conclusion:**  
Conclude with a relevant way forward  

**Introduction**  
The Ministry of Statistics and Programme Implementation released the GDP (gross domestic product) and GVA (gross value added) data for the first quarter of the current financial year. The government used the Year-on-Year (Y-o-Y) comparison method — which showed that the GDP grew by 20% in Q1 this year as against the Q1 last year — to claim that India was witnessing a V-shaped recovery.

**Body**  

**V-shaped recovery in India**

- **V-shaped recovery is underway**, as demonstrated by a sustained resurgence in high frequency indicators such as power demand, e-way bills, GST collection, steel consumption, etc.
- India became the fastest country to roll-out 10 lakh vaccines in 6 days and also emerged as a leading supplier of the vaccine to neighbouring countries and Brazil.
- Total expenditure of the government surged 48.3 per cent on year-on-year (y-o-y) basis in the month of November. While, capital expenditure shrugged off a three-month contraction and expanded 248.5 per cent. This was mainly due to the introduction of the Atmanirbhar Bharat package.
- After contracting for 9 consecutive months, merchandise imports finally experienced a growth of 7.6 per cent (y-o-y) in December 2020. The revival was led by gold, electronic goods and vegetable oils.
- Rising imports of pearls and precious stones, machinery, electronic goods and textiles reflect the revival of domestic activity as they are of the nature of intermediate goods in supply chains.

- This also augurs well for exports going forward. This suggests that moribund absorptive capacity of the economy is coming back to life, backed by domestic demand.

- The Covid-19 pandemic dragged the sensex to record low in late March 2020. But, it staged a strong recovery from the lows. Both the BSE and NSE indices finally wrapped up 2020 on a bullish note, with sensex gaining nearly 16 per cent.

Recovery has not been V-shaped

- MGNREGA employment highest: Around 64 million are families employed under MGNREGA. It is more than ten times the total number of people employed by all the companies listed on India’s stock exchanges combined. We should remember that citizens utilize MGNREGA only when the situation is extremely dire and there are no other alternative sources of income.

  - Currently, 18 million families are dependent on MGNREGA, roughly the same number in August last year.

  - Clearly, there is no economic recovery, ‘V’ or otherwise, for these millions of families.

  - So, while stock markets are booming to all-time highs, a record number of Indians are seeking employment from MGNREGA for a bare minimum income.

- Manufacturing, construction and services are low: Manufacturing, services and construction are the real economic activities that generate good quality jobs and incomes for the vast majority of people.

  - However, these are not in good state. Latest CSO data shows that manufacturing activity in June 2021 is at the same level as four years ago in 2017, construction activity is at the level of five years ago in 2016, and trade/transport services activity is at the level of six years ago in 2015 (at constant prices).

- Lack of consumption: When people do not have sufficient incomes, it affects their consumption too. This is evidenced in the fact that private consumption in the June 2021 quarter is at the same level as in 2017.

- Fixed Capital formation is lagging: When private consumption is weak, businesses refrain from undertaking new projects and investment falls. This is seen in fixed capital formation being stuck at 2017 levels.

- Finally, it is argued that easy money from the United States is finding its way to other countries, pushing up asset prices and financial market valuations. Neither does this help improve livelihoods for the vast majority of people, nor will this last long. It is thus futile to
showcase foreign flows or stock market indicators as a sign of the robustness of India’s economy.

Way forward

- Rebound to be led by low base and continued normalization in economic activities as the rollout of COVID-19 vaccines gathers traction.
- A favourable monetary policy ensuring abundant liquidity and immediate relief to debtors while unclogging monetary policy transmission.

What is the inflation? Differentiate between demand pull and cost push inflation?

Highlight the supply-side factors behind recent inflationary trends in India. (250 words)

Difficulty level: Moderate
Reference: The Hindu

Why the question:
With the Union Budget 10 days away, many economic observers are now focused on what support the Centre can offer the economy, which is still struggling to recover from the pandemic.

Key Demand of the question:
To write about the differences between demand pull and cost push inflation and the factors causing inflation in India off late.

Structure of the answer:
Introduction:
Begin by defining inflation.

Body:
First, in detail bring the comparison between demand pull and cost push inflation. Nature, factors causing it, effects etc.

Next, write about the reasons for increasing trends of inflation in India off late and its impact. 

Next, suggest steps to overcome the same.

Conclusion:
Conclude by writing a way forward.

Introduction

Inflation refers to the rise in the prices of most goods and services of daily or common use, such as food, clothing, housing, recreation, transport, consumer staples, etc. Inflation measures the average price change in a basket of commodities and services over time. The opposite and rare fall in the price index of this basket of items is called ‘deflation’. Inflation is indicative of the decrease in the purchasing power of a unit of a country’s currency. This is measured in percentage.

Body

Differences between Demand pull and cost push inflation

- Demand-pull inflation occurs when there is an increase in aggregate demand, categorized by the four sections of the macroeconomy: households, businesses, governments, and foreign buyers.
- Cost-push inflation means prices have been “pushed up” by increases in the costs of any of the four factors of production—labor, capital, land, or entrepreneurship—when companies are already running at full production capacity.
The demand-pull inflation is when the aggregate demand is more than the aggregate supply in an economy, whereas cost push inflation is when the aggregate demand is same and the fall in aggregate supply due to external factors will result in increased price level.

Demand-pull inflation arises when the aggregate demand increases at a faster rate than aggregate supply. Cost-push inflation is a result of an increase in the price of inputs due to the shortage of cost of production, leading to decrease in the supply of outputs.

Demand-pull inflation describes, how price inflation begins. On the other hand, cost-push inflation explains Why inflation is so difficult to stop, once started.

The reason for demand-pull inflation is the increase in money supply, government spending and foreign exchange rates. Conversely, cost-push inflation is mainly caused by the monopolistic groups of the society.

The policy recommendation on demand-pull inflation is associated with the monetary and fiscal measure which amounts to the high level of unemployment. Unlike, cost push inflation, where policy recommendation is related to administrative control on price rise and income policy, whose objective is to control inflation without increasing unemployment.

supply-side factors behind recent inflationary trends in India

Supply side constraints, which are now being referred to as a major problem, simply mean that production in the economy is unable to keep pace with rising demand due to a variety of factors such as inadequate infrastructure, lack of credit, availability of labour and availability of technology.

For example, it is common to hear from business leaders that though India is a country where labour is abundant, it is difficult to find quality people.

Further, availability of fuel is affecting capacity creation in power generation, which will impact sectors that depend on power for production, affecting overall production in the economy.

Factors such as these add up and do not allow the economy to produce at the desired pace. As a consequence, supply to the market place falls short of demand and results in higher inflation.

The lockdowns disrupted supplies and that added to shortages and price rise.

Prices of medicines and medical equipment rose dramatically.

Prices of items of day-to-day consumption also rose.

Fruits and vegetable prices rose since these items could not reach the urban markets.

Industry and services estimated to contract by 9.6% and 8.8% respectively during FY21

Measures to keep the inflation under control

Monetary policy Measures: Maintaining price stability is the foremost objective of the monetary policy committee of RBI. However, during the pandemic, growth has taken centre stage and RBI has rightly cut interest rates.
• **Commodity prices**: GoI needs to remove supply side bottlenecks. For example, GoI can immediately offload 10-20% of its pulses stock with NAFED in the open market.

• **Fuel prices**: Bringing them under GST would reduce the prices by at least 30 rupees. GST council must agree to this with haste.

• **Policy measures**: Navigating out of this will need a fiscal stimulus to shore up consumer spending, an investment revival to increase the productive capacity of the economy, and a careful management of inflationary expectations.

• Concomitantly, the government will also need to **pursue redistribution of income** to reduce the widening disparity.

• This also calls for **fiscal prudence to cut wasteful spending**, find new revenue through asset sales, mining and spectrum auctions, and build investor confidence.

**Conclusion**

With the rise in inflation amidst a second wave, the balancing acumen of the MPC will now be sorely tested. Factors like rising commodity prices, supply chain disruptions are expected to raise overall domestic inflation. Government and RBI need to chalk out a fiscal plan to ensure that the inflation doesn’t burden the common man in the country.

‘India’s approach to Bilateral Investment Treaty is riddled with inconsistencies and may fail to achieve the anticipated objectives’. Clarify the statement and specify what can India do to correct it. (250 Words)

**Difficulty level**: Difficult

**Reference**: The Hindu

**Why the question:**
India has been facing a slew of issues with its Old BIT and even its new model BIT 2016 is not very consistent. This may have an impact on India’s attractiveness to foreign Investment.

**Key Demand of the question:**
Highlight the issues with India’s BIT and suggest way forward

**Structure of the answer:**

**Introduction:**
Begin by defining what is BIT and give a brief background of it.

**Body:**
First, specify the issue that India had with the Old BIT which led it to form a model BIT 2016 e.g. India lost the cases in International tribunal for retrospective taxes, cancellation and revocation of spectrum and telecom licences, etc.

Then, highlight the issues with New BIT (e.g. India shifted from investor friendly approach to overly protectionist one, thus impacting its image)

Suggest few steps that India can take to correct the issues.

You may refer to following article The Diplomat, InsightsIndia

**Conclusion:**
Conclude by highlighting that India needs to take a balanced approach towards BITs with an effective ISDS provision.

**Introduction**
A **Bilateral Investment Treaty (BIT)** is an agreement between two countries that sets up “rules of the road” for foreign investment in each other’s countries. BITs typically serve to protect...
**investments** made by investors on a reciprocal basis, specifying conditions on regulatory oversight of the host state and limiting interference with the rights of foreign investors.

**Body**

**India’s approach to BIT and challenges**

- Since signing the first BIT in 1994 with the UK, India has inked 86 such bilateral treaties, the latest being with Brazil in 2020.
  - BITs have been one of the major drivers of FDI inflows into India.
  - A 2016 study suggests that by providing substantive protection and commitment to foreign investors, BITs indeed contributed to rising FDIs in the 2001-2012 period.
- The Indian model of BIT, 2003 contained close semblance with the India-UK BIT. From 1994 to 2011, India had signed more than 80 BITs and ratified over 70.
- However, there have been many cases of the penalty awarded by an International Dispute Settlement (ISDS) tribunal served against India.
  - For example in cases involving regulatory measures such as the imposition of retrospective taxes, cancellation and revocation of spectrum and telecom licences.
- This led to a review of the BITs, and in 2016 India launched the Model BIT. It aims to act as a base for negotiating new BITs with other States, as well as for re-negotiation of the existing ones.
- Since its adoption, India has unilaterally terminated 66-odd BITs between 2016 to 2019. It had sent negative signals to the global investor community on the grounds of being protectionist.
- This is evident as no country has shown an inclination to re-negotiate based on the Model BIT. Since 2016, India has signed just three treaties, none of which is in force yet.
- Model BIT narrowed the definition of investment that needed to qualify for BIT protection.
  - the definition of investment in the Model BIT also contains a negative list, which precludes portfolio investments, interest in debt securities, intangible rights, etc. from the definition of investment.
  - Thus, the new definition does not take into account the increased scope of foreign investments in the modern era of globalization and liberalization.
- Model BIT contains a clause mandating exhaustion of domestic remedy prior to initiating international arbitration proceedings.
- Model BIT included a ‘Treatment of Investments’ clause with a broadly-worded undertaking that neither party shall subject investments to measures that are manifestly abusive and in violation of due process.

**A new approach to BIT**

- There is a need to revise the definition of investment in the form of a hybrid between an asset-based and enterprise-based definition, given averseness of Foreign investors.
• India may explore the option to revise the standard of treatment clause to align it with international practices and include the traditional standard of protection of fair and equitable treatment.

• India must give clarification regarding the open-ended terms in the Model BIT. This could result in India facing fewer disputes and BIT claims.

A New Model

- Government wants to renew bilateral investment agreements with 47 nations
- It has reached out to these countries

**WHY**
- India has been dragged for international arbitration by many investors
- Treaties will be updated in keeping with new economic situation

**HOW**
- Treaties that complete ten years will be allowed to lapse
- These treaties will be negotiated as per the model treaty approved
- The model treaty will be template for all future treaties
- Recently signed treaties will be revised later

**HOW WILL IT HELP**
- Foreign investors to exhaust local judicial remedies before seeking arbitration
- Tax issues will be kept out of bilateral investment treaties

Way forward

- In the post-COVID-19 world, regulatory risks will further exacerbate, subjecting foreign investment to arbitrary and whimsical behaviour of countries.

- India may explore the option to revise the standard of treatment clause to align it with international practices and include the traditional standard of protection of fair and equitable treatment.

- Also, must give clarification regarding the open-ended terms in the Model BIT.

- India needs to adopt a balanced approach towards BITs with an effective ISDS provision.

- This will facilitate Indian investors in defending their investment under international law should a country, like Sri Lanka, renege on an agreement.

How do we measure unemployment? Does it capture the true unemployment situation in India? Suggest reforms in this direction. (150Words)

*Difficulty level: Difficult
Reference: Indian Express
Why this question
Unemployment has become a chronic problem in India and in recent years the situation has only worsened. There has also been a debate that unemployment measurement doesn’t capture true data esp. for the informal sector
Key demand of the question.
The question wants us to enumerate the methods of unemployment calculation in India and their efficacy
**Structure of the answer**

**Introduction**– Define unemployment and give the latest data on it e.g present some statistics from the Labour reports or any other authentic report like the CMIE report.

**Body**-
Mention methods of unemployment calculation E.g

**Usual Status Approach**

**Weekly Status Approach**

**Daily Status Approach**

Discuss the issues with this method as well as general discourse e.g

Employment does not usually figure in the public discourse orchestrated by political parties, either at the Centre or in the States.

Political parties and politicians have failed in creating gainful employment.

Give suggestion to improve the capture of true unemployment figure e.g. Mahesh Vyas, the CEO of CMIE, advocates using “Employment Rate” (or ER henceforth) to correctly understand what is happening to joblessness in India.

Also, give some government steps to reduce unemployment in India

**Conclusion**–
Give a fair and balanced conclusion on the given issue.

**Introduction**

Unemployment is tracked by looking at the Unemployment Rate (or UER). The UER is the percentage of people in the labour force who demanded work but did not get it. The Centre for Monitoring Indian Economy (CMIE) recently released the unemployment status report of India for the month of December, 2021. According to the report, the unemployment rate in the country was 7.91% in December. It was 7% in November.

**Body**

**Background: Statistics**

- Highest unemployment rate was reported in Haryana. Around 34.1% were unemployed in the state.
- Rajasthan had the second highest unemployment rate. It was 24.1% in the state. Following Rajasthan, Jharkhand (17.3%), Bihar (16%) and Jammu and Kashmir (15%) were in second, third and fourth places respectively.
- The December unemployment rate was the highest in the past four months. The previous high was reported in August, 2021 (8.32%).
- The urban unemployment rate of the country was 9.3%. It was 8.21% in November.
- The rural unemployment rate was 7.28%. It was 6.44% in November.

**UER may not capture true unemployment situation in India**

- Under normal circumstances, the UER is a perfectly fine metric to track unemployment but in India’s case, and especially over the past decade, UER is becoming ineffective in accurately assessing the true level of unemployment distress.
  - That’s because the labour force itself has been shrinking rapidly.
- Over the past decade is that the Labour Force Participation Rate in India has been falling.
As such, often when it appears that UER has fallen, it is not because more jobs have been created but because fewer people have demanded jobs (in other words, the LFPR has fallen).

- In most other comparable countries, the LFPR is between 60% to 70%. In India, it has been hovering around 40%.
  - This means, in other countries 60% of people belonging to the working-age group (i.e. 15 years and above) demand a job while in India only 40% look for a job.
  - The 20–percentage point differential — that too at the scale of India’s population — represents a huge number (millions) of people who do not have any jobs.

- But since millions do not formally “demand” work, there is an undercounting of unemployed people in India. This is why UER fails to adequately capture the unemployment distress in India

Measures suggested

- One of the remedies of the unemployment situation in India is rapid industrialisation. Increased number of industries will translate into increased number of employment opportunities.
- The curriculum should be changed with increased focus on learning and skill development.
- More institutions need to be established that offer vocational courses that will translate directly into relevant jobs.
- Self-employment should be encouraged more with introduction of liability free loans and government assistance for funding.
- Incubation centres need to be promoted to cultivate original business ideas that will be financially viable.
- Better irrigation facilities, better farming equipment, dissemination of knowledge regarding multiple crop rotation and crop management should be focused on.
- Government as well as leading business houses of the country should seek to invite more foreign collaboration and capital investment in every sector.
- There are number of labour-intensive manufacturing sectors in India such as food processing, leather and footwear, wood manufacturers and furniture, textiles and apparel and garments.
  - Special packages, individually designed for each industry are needed to create jobs.
- Public investment in sectors like health, education, police and judiciary can create many government jobs.

Conclusion

In 2020, although the economy was in a very poor state following the deleterious effects of demonetisation, the rural economy was faring reasonably well on the back of two good monsoons.
However, after a year of distress, and with some part of the workforce still not having returned to their work places, rural incomes are expected to be under pressure. Economists say they are already seeing signs of sluggishness in rural consumption.

The Reserve Bank of India (RBI) has done much of the heavy lifting, it is now the turn of the government to step up spending. The economy needs a punchy fiscal stimulus, a big booster dose, targeted at the small and unorganised sectors.

A data protection law must strike a balance between privacy rights of the citizens and ease of doing business. Comment in the context of Personal Data Protection Bill, 2021. (250 words)

Difficulty level: Tough
Reference: Indian Express

Why the question:
After two years of deliberation, the Parliamentary Joint Committee on the Personal Data Protection Bill, 2019 (JPC) tabled its report this week. The recommendations are appended with a redrafted version of the law, named the “Data Protection Bill, 2021”

Directive word:
Comment– here we must express our knowledge and understanding of the issue and form an overall opinion thereupon.

Structure of the answer:
Introduction:
Begin by giving the aims and objectives of the Data Protection Bill, 2021.

Body:
In the first part, mention the various features of Data Protection Bill, 2021
Next, bring out the various adverse impacts of the bill on ease of doing business – regulatory burdens, impediments to start ups, data transfer and onerous regulatory environment etc.

Conclusion:
Conclude by giving a way forward to address the above issues.

Introduction
Data protection is the process of protecting data and involves the relationship between the collection and dissemination of data and technology. It aims to strike a balance between individual privacy rights while still allowing data to be used for myriad purposes. The sheer volume of people’s data on the internet and the advancements in technologies such as Artificial intelligence, Data mining and machine learning poses a threat of abuse and misuse of data.

Body
Features of Data protection bill

- **Non-personal data:** The Bill has a changed name and scope. It is now called Data Protection Bill 2021 changed from Personal Data Protection Bill. This means the Bill would also include non-personal data.
  - The Parliamentary committee has also said that this Bill should cover both sets of data till an additional framework is established to distinguish between personal and non-personal data.
• **Collection and storage:** The bill regulate personal data related to individuals, and the processing, collection and storage of such data.

• **Data Principal:** Under the bill, a data principal is an individual whose personal data is being processed.

• **Data fiduciary:** The entity or individual who decides the means and purposes of data processing is known as data fiduciary.

• **Data processing:** The Bill governs the processing of personal data by both government and companies incorporated in India.

• **Data localization:** It also governs foreign companies, if they deal with personal data of individuals in India.

• **General consent:** The Bill provides the data principal with certain rights with respect to their personal data. Any processing of personal data can be done only on the basis of consent given by data principal.

• **Data Protection Authority:** To ensure compliance with the provisions of the Bill, and provide for further regulations with respect to processing of personal data of individuals, the Bill sets up a DPA.

• **Arbitrary and intrusive:** As demonstrated by the Pegasus case, the current frameworks for protecting citizens from arbitrary and intrusive State action lack robustness.

**Concerns regarding provisions leading to surveillance state**

• **Grounds of expediency:** the use of this provision on grounds of expediency is an extremely low bar for the Government to meet.

• **Non requirement for exemption order:** There is no requirement for an exemption order to be proportionate to meeting a particular State function.

• **No oversight on executive actions:** There is no scope for oversight over the executive’s decision to issue such an order or any safeguards prescribed for this process.

• **State surveillance:** Section 36(a) of the Bill provides for an exception where personal data is being processed against criminal investigation. This provision could therefore encourage vigilantism or enable privatized surveillance.

**Issues regarding ease of doing business**

• The framework under the Bill is premised on a centralised Data Protection Authority with a wide discretionary remit to formulate regulation.

• The Bill has broad-based restrictions on the transfer of data overseas that are likely to splinter our market from the global digital economy.

• It seeks to impose onerous compliance obligations that have little to do with data protection.

• It sets forth an inflexible framework that is bereft of any formal consultative rule-making process.
• Substantial portions of the Bill are out of sync with international data protection practices, which could blunt India’s competitive advantage as a digital market.

• A narrower category of personal data that is considered “critical” would be entirely prohibited from transfer outside India. It is the authority who is to define “critical data” without even an indicative hint of its scope in the Bill. These requirements destroy the basic value of the digital economy — connectivity beyond physical barriers.

• The burden of onerous regulation will be fatal to new entrants, while the costs will be absorbed by established incumbents.

• The Bill, if adopted, will ensure that the start-up ideas of today that could become unicorns of tomorrow are stillborn.

Conclusion

Considering the data privacy as the fundamental right of a citizen and economic downturns of the potential breaches in data, government need to reconsider the above pending issues. A robust data protection law is the need of the hour. Due importance needs to be given on public awareness, better implementation and regulation and efficient grievance redressal as well.

Value generation through technology requires an open and innovation-friendly regulatory environment. The government, therefore, must closely consider each of the policy prescriptions in the Bill including the unintended but deleterious consequences of the regulatory regime mooted.

Value addition

Background: Data protection genesis in India

• India does not have any dedicated legal framework for data protection. Presently some acts cover the data protection in general.
  
  o Sec 43A of Information Technology Act 2000 protects user data from misuse but it is applicable to only corporate entities and not on government agency. Also, the rules are restricted to sensitive personal data only — medical history, biometric information among other things.
  
  o Other acts like Consumer Protection Act 2015, Copyrights Act 1957 among others also attempt to protect the personal information.

• The need for a more robust data protection legislation came to the fore in 2017 post the Supreme Court’s landmark judgment in Justice K.S. Puttaswamy (Retd) v. Union of India that established the right to privacy as a fundamental right.

• In 2018, a draft version of the bill was prepared by a committee headed by retired Justice B N Srikrishna. Recently, the Personal Data Protection Bill, 2019 was introduced in Lok Sabha by the Minister of Electronics and Information Technology.

Need for Data Protection in India

India has around 40 cr internet users and 25cr social media users who spend significant time online. The average cost for data breach in India has gone up to Rs. 11.9 crore, an increase of 7.9% from 2017. Moreover, in the KS Puttaswamy case, the Supreme Court has declared Data Privacy as a
fundamental right under Article 21. Hence it becomes all the more significant to ensure data protection. **The reasons are as follows:**

- **Data Export:** Most of the data storage companies are based abroad. Especially the e-commerce companies that have exabytes of data on Indians. They also export data to other jurisdiction making it difficult to apply Indian laws.

- **Data Localization:** Enforcing data localization has faced backlash from many private entities and their home governments. There hundreds of private players are involved in data dynamics which makes it difficult to apply uniform data protection framework.

- **User Consent:** Generally, the application using pre-ticked boxes on consent while asking users regarding the acceptance to the terms and conditions.

- **Privacy Breach:** It is usually difficult to trace the perpetrator invading the data privacy.

- **Privacy laws:** Currently, the usage and transfer of personal data of citizens is regulated by the Information Technology (IT) Rules, 2011, under the IT Act, 2000. However, this are applicable only to private entities and not on government agency.

- **Data ownership:** As per TRAI guidelines, individuals own the data, while the collectors and data processors are mere custodians of data who are subject to regulations.

**Issues with the bill regarding exemption to state**

- **Exemptions to the govt:** Section 35 of the bill permits the Central Government to exempt any agency of the Government from the provisions of the law.

- **No reasonable exemptions:** There is no sufficient reason for government agencies to be exempted from basic provisions of the Bill.

- **Easy breach:** Though this would be subject to procedures, safeguards, and oversight mechanisms to be prescribed by the Government.

- **Executive hegemony:** There is no scope for oversight over the executive’s decision to issue such an order.

Cryptocurrencies are said to empower people on one hand but at the same time create regulatory hurdles on the other. In light of the statement discuss the pros and cons of banning cryptocurrencies. (150 Words)

**Introduction**

A cryptocurrency is a digital asset designed to work as a medium of exchange wherein individual coin ownership records are stored in a ledger existing in a form of a computerized database. It uses strong cryptography to secure transaction records, to control the creation of additional coins, and to verify the transfer of coin ownership. It typically does not exist in physical form (like paper money) and is typically not issued by a central authority.

**Body**

**Pros of banning cryptocurrencies**
• **Sovereign guarantee:** Cryptocurrencies pose risks to consumers. They do not have any sovereign guarantee and hence are not legal tender.

• **Market volatility:** Their speculative nature also makes them highly volatile. For instance, the value of Bitcoin fell from USD 20,000 in December 2017 to USD 3,800 in November 2018.

• **Risk in security:** A user loses access to their cryptocurrency if they lose their private key (unlike traditional digital banking accounts, this password cannot be reset).

• **Malware threats:** In some cases, these private keys are stored by technical service providers (cryptocurrency exchanges or wallets), which are prone to malware or hacking.

• **Money laundering.**

**Issues Associated with Banning Decentralised Cryptocurrencies**

• **Blanket Ban:** The intended ban is the essence of the Cryptocurrency and Regulation of Official Digital Currency Bill, 2021. It seeks to prohibit all private cryptocurrencies in India.

• However, categorising the cryptocurrencies as public (government-backed) or private (owned by an individual) is inaccurate as the cryptocurrencies are decentralised but not private.

• Decentralised cryptocurrencies such as bitcoin aren’t or rather, can’t be controlled by any entity, private or public.

• **Brain-Drain:** Ban of cryptocurrencies is most likely to result in an exodus of both talent and business from India, similar to what happened after the RBI’s 2018 ban.

• Back then, blockchain experts moved to countries where crypto was regulated, such as Switzerland, Singapore, Estonia and the US. With a blanket ban, blockchain innovation, which has uses in governance, data economy and energy, will come to a halt in India.

• **Deprivation of Transformative Technology:** A ban will deprive India, its entrepreneurs and citizens of a transformative technology that is being rapidly adopted across the world, including by some of the largest enterprises such as Tesla and MasterCard.

• **An Unproductive Effort:** Banning as opposed to regulating will only create a parallel economy, encouraging illegitimate use, defeating the very purpose of the ban.

• A ban is infeasible as any person can purchase cryptocurrency over the internet.

• **Contradictory Policies:** Banning cryptocurrency is inconsistent with the Draft National Strategy on Blockchain, 2021 of the Ministry of Electronics and IT (MeitY), which hailed blockchain technology as transparent, secure and efficient technology that puts a layer of trust over the internet.

**Way Forward**

• **Regulation is the Solution:** Regulation is needed to prevent serious problems, to ensure that cryptocurrencies are not misused, and to protect unsuspecting investors from excessive market volatility and possible scams.

• The regulation needs to be clear, transparent, coherent and animated by a vision of what it seeks to achieve.
• **Clarity on Crypto-currency definition**: A legal and regulatory framework must first define crypto-currencies as securities or other financial instruments under the relevant national laws and identify the regulatory authority in charge.

• **Strong KYC Norms**: Instead of a complete prohibition on cryptocurrencies, the government shall rather regulate the trading of cryptocurrencies by including stringent KYC norms, reporting and taxability.

• **Ensuring Transparency**: Record keeping, inspections, independent audits, investor grievance redressal and dispute resolution may also be considered to address concerns around transparency, information availability and consumer protection.

• **Igniting the Entrepreneurial Wave**: Cryptocurrencies and Blockchain technology can reignite the entrepreneurial wave in India’s start-up ecosystem and create job opportunities across different levels, from blockchain developers to designers, project managers, business analysts, promoters and marketers.

**Conclusion**

India is currently on the cusp of the next phase of digital revolution and has the potential to channel its human capital, expertise and resources into this revolution, and emerge as one of the winners of this wave. All that is needed to do is to get the policymaking right. Blockchain and crypto assets will be an integral part of the Fourth Industrial Revolution, Indians shouldn’t be made to simply bypass it.

Do you agree that the Indian economy has recently experienced V-shapes recovery? Give reasons in support of your answer. (250 words)

**Introduction**

The Ministry of Statistics and Programme Implementation released the GDP (gross domestic product) and GVA (gross value added) data for the first quarter of the current financial year. The government used the Year-on-Year (Y-o-Y) comparison method — which showed that the GDP grew by 20% in Q1 this year as against the Q1 last year — to claim that India was witnessing a V-shaped recovery.

**Body**

**V-shaped recovery in India**

• **V-shaped recovery is underway**, as demonstrated by a sustained resurgence in high frequency indicators such as power demand, e-way bills, GST collection, steel consumption, etc.

• India became the fastest country to roll-out 10 lakh vaccines in 6 days and also emerged as a leading supplier of the vaccine to neighbouring countries and Brazil.

• Total expenditure of the government surged 48.3 per cent on year-on-year (y-o-y) basis in the month of November. While, capital expenditure shrugged off a three-month contraction and expanded 248.5 per cent. This was mainly due to the introduction of the Aatmanirbhar Bharat package.
After contracting for 9 consecutive months, merchandise imports finally experienced a growth of 7.6 per cent (y-o-y) in December 2020. The revival was led by gold, electronic goods and vegetable oils.

- Rising imports of pearls and precious stones, machinery, electronic goods and textiles reflect the revival of domestic activity as they are of the nature of intermediate goods in supply chains.
- This also augurs well for exports going forward. This suggests that moribund absorptive capacity of the economy is coming back to life, backed by domestic demand

The Covid-19 pandemic dragged the Sensex to record low in late March 2020. But, it staged a strong recovery from the lows. Both the BSE and NSE indices finally wrapped up 2020 on a bullish note, with Sensex gaining nearly 16 per cent.

**Recovery has not been V-shaped**

- **MGNREGA employment highest:** Around 64 million are families employed under MGNREGA. It is more than ten times the total number of people employed by all the companies listed on India’s stock exchanges combined. We should remember that citizens utilize MGNREGA only when the situation is extremely dire and there are no other alternative sources of income.
  - Currently, 18 million families are dependent on MGNREGA, roughly the same number in August last year.
  - Clearly, there is no economic recovery, ‘V’ or otherwise, for these millions of families.
  - So, while stock markets are booming to all-time highs, a record number of Indians are seeking employment from MGNREGA for a bare minimum income.

- **Manufacturing, construction and services are low:** Manufacturing, services and construction are the real economic activities that generate good quality jobs and incomes for the vast majority of people.
  - However, these are not in good state. Latest CSO data shows that manufacturing activity in June 2021 is at the same level as four years ago in 2017, construction activity is at the level of five years ago in 2016, and trade/transport services activity is at the level of six years ago in 2015 (at constant prices).

- **Lack of consumption:** When people do not have sufficient incomes, it affects their consumption too. This is evidenced in the fact that private consumption in the June 2021 quarter is at the same level as in 2017.

- **Fixed Capital formation is lagging:** When private consumption is weak, businesses refrain from undertaking new projects and investment falls. This is seen in fixed capital formation being stuck at 2017 levels.

- Finally, it is argued that easy money from the United States is finding its way to other countries, pushing up asset prices and financial market valuations. Neither does this help
improve livelihoods for the vast majority of people, nor will this last long. It is thus futile to showcase foreign flows or stock market indicators as a sign of the robustness of India’s economy.

**Way forward**

- Rebound to be led by low base and continued normalization in economic activities as the rollout of COVID-19 vaccines gathers traction.
- A favourable monetary policy ensuring abundant liquidity and immediate relief to debtors while unclogging monetary policy transmission.

**What is the Minimum Support Price (MSP) system for agricultural commodities in India? Is MSP System helping the farmers, or is failing them? Critically examine (250 Words)**

**Introduction**

**Minimum Support Price (MSP)** is the rate at which the government buys grains from farmers. Currently, it fixes MSPs for 23 crops grown in both Kharif and Rabi seasons. The government recently hiked the MSP for wheat by Rs. 40 to Rs. 2,015 per quintal and for mustard seed by Rs. 400 to Rs. 5,050 per quintal for the current crop year in order to boost crop area as well as income of farmers.

**Body**

**Yes, MSP helps farmers to an extent**

- MSP has been beneficial in transferring incomes to rural areas and to counter farm level inflation.
- It can also counter the agricultural distress brought on by natural hazards in the country. It gives farmers hope of earning more in the new sowing season.
- In the last few years, India has become a net importer of pulses. Massive hike in the MSP of these crops will encourage the farmers to grow nutritional crops. It will help in changing the cropping pattern which was long due.
- A higher MSP regime will also help in achieving the Government’s target of doubling farmer’s income by 2022.
- It also acts as an incentive for farmers to produce the crop which is in short supply.
- Higher profits for the farmer will also help them to invest in necessary infrastructure and equipment.
- The MSP to some extent will protect the farmer by guaranteeing a minimum floor price so that they can plan in advance for the next season.

**However, MSP fails the farmers more**

The trouble with MSP is that while it is touted as an all-important factor for farmers promising an instant rise in their income and stability, it also has many drawbacks in implementation. This affects the price realisation of farmers, in reality for several reasons.
• **Methodology:** MSP covers numerous costs such as the cost of sowing (A2) and labour (FL). These considerations are controversial with suggestions that it should be based on comprehensive costs (C2), which also include land rent costs.

• **Inflation:** Too much of a hike on MSP either paves way for inflationary effects on the economy, with a rise in prices of food grains and vegetables, or loss to government treasury if it decides to sell at a lower price as compared to the higher MSP it bought at.

• **Diverse factors:** MSP is a nationwide single price policy. However, the actual costing for production varies from place to place, more severely so in areas lacking irrigation facilities and infrastructure. Thus, not all farmers have equal benefits.

• **Procurement at MSP is flawed:** First, procurement of wheat and paddy for meeting the requirement of the public distribution system (PDS) is undertaken largely by state governments.
  
  o Of the total procurement of wheat and paddy from farmers, the Food Corporation of India’s (FCI’s) share is less than 10%.
  
  o In the north-east and many other states, procurement operations are almost non-existent and farmers are forced to sell below MSP.
  
  o As the experiences of these schemes show, the benefit of higher MSPs for kharif crops or rabi, is unlikely to be available to most farmers as the states lack adequate storage capacity, working capital and manpower for undertaking large-scale procurement of all commodities.
  
  o The MSP-based procurement system is also dependent on middlemen, commission agents and APMC officials, which smaller farmers find difficult to get access to.

• **Agri-Infrastructure:** Hiking the MSP without investing in infrastructure is just a short-term play. While it does deliver immediate results, long-term developments to back-it up are also important.

• **Environmental harm:** It degrades the soil because of irrespective of the soil condition, some crops are preferred which have MSP over them which results in exploitation of group water resources, alkalinity, decrease in the production of the crops in long run and much harm to environment.

**Conclusion**

The government should shift its focus from providing only price support to farmers and focus on building better infrastructure, minimizing the gap between farmers and the market, land reforms, policy reforms to increase flow of credit to farmers, establishing food-processing industries for perishable goods, providing better irrigation facilities etc so, that agriculture emerges as a viable means of sustenance.

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How can infrastructure revolution in the field of mass transport help in India becoming an economic superpower in near future? Discuss. (250 words)

**Introduction**
Union budget 2021-22 gave a massive push to infrastructure sector by allotting Rs 233083 crore to enhance transport infrastructure and through National Infrastructure Pipeline (NIP) a Rs 111 lakh crore plan for financial year 2019-25. India fared well in logistics performance index with a jump from 66th position in 2014 to 44th in 2018. However, India’s logistics cost is as high as 13-14% of GDP compared to single digits of many developed countries.

Body

Need of critical transport infrastructure

- Infrastructure in transport is necessary to ensure 6Cs i.e. Common, connected, convenient, congestion free, clean and cutting edge technology
  - Common and convenient: to ensure comfort in public transport with better end mile connectivity
  - Connected: to ensure end mile connectivity throughout the country – connectivity of north east, Connectivity with neighbouring countries under central Asian connectivity projects, kaladan multimodal connectivity projects
  - Congestion free: India has topped the TomTom traffic index 2019 with its 4 cities among the 10 most congested cities globally
  - Clean: transport sector is major contributor to pollution in India. According Centre for science and environment – transport sector in India contributes about 15% of CO2 emissions
  - Cutting edge: Need of AI aided smart public transport through big data being generated in automatic vehicle location, automatic fare collection (Fastags), e vehicles etc

Case study – European union

Nations bargaining power depends on economic integration of region with its market and free movement of goods through common and interconnected transport across the borders. European countries fared well with integrated inland water transport and better connected roadways and railways helping them grow into super powers of region.

India’s revolution in infrastructure

- India’s transport demand grown by almost 8 times since 1980 more than any other Asian economies accompanied by thriving auto industry and allied economic growth
- India through its NIP and GHATI Shakti initiative highest focus has been on transport sector (~15% of allocation)
- Through Bharatamala project and Sagar mala projects India aims to integrate both land connectivity and coastal port connectivity helping better transport of goods to each mile
- India has been part of International north south corridor as part of central Asian connectivity and beyond central Asia to Europe and Russia
- Kaladan multimodal projects, Mekong ganga cooperation are part of India aim to connectivity and transport
Cooperation with JICA (Japan) for DMIC and World bank over Jal Vikas Marg project aims to reduce cost of transport sector and ensure low cost, clean water transport in India.

Infrastructure revolution - a panacea

- Infrastructure in mass transport ensures the following
  - **Better connectivity**: north east India roads investment programme, connectivity of dhola sadiya bridge, Atal tunnel project in Jammu and Kashmir
  - **Employment**: through better connectivity within urban areas and rural – urban population
  - **Reduction in pollution**: as transport sector mostly dependent on fossil fuels, with better upgradation to e vehicles, CNG, adoption of biofuel-ethanol blending can reduce pollution in India

- **Better public transport** with end mile connectivity can reduce traffic congestion, save time and fuel
- Roads carry almost 85% of country's passenger traffic and 60% of freight thus need revamp infrastructure to cut logistic cost of transport

Conclusion

Thus India needs to realign its goals on the lines of BRI (belt and road initiative) of China there by controlling global supply chain market. With better connectivity and infrastructure in transport sector India can unleash its aim of global economic superpower.

India needs focused policy interventions to overcome unemployment due to the impact of the pandemic, automation as well as educated unemployment. Discuss. (250 words)

Difficulty level: Tough
Reference: Live Mint

Why the question:
The country’s labour population ratio (LPR) has dropped to 42%, according to the International Labour Organization.

Key Demand of the question:
To write about the policy measures required to offset impact of the pandemic, automation and educated unemployment

Directive word:
**Discuss** – This is an all-encompassing directive – you must debate on paper by going through the details of the issues concerned by examining each one of them. You must give reasons for both for and against arguments.

Structure of the answer:
Introduction:
Begin by citing a statistic to show the extent of unemployment in India.

Body:
First, mention how the above mention three factors have contributed to various facets of unemployment in India and its impact.
Next, stress on the targeted policy that are needed to specially address the above and overcome them.

**Conclusion:**
Conclude by writing a way forward.

**Introduction**

Unemployment has become a chronic problem of India and in the recent years the situation has only worsened. The Centre for Monitoring Indian Economy (CMIE) recently released the unemployment status report of India which showed the unemployment rate in the country was 7.91% in December 2021. It was 7% in November 2021.

**Body**

**Unemployment crisis in India**

- With migrant labourers retreating to their native places, the impact seems to be more severe in urban areas where the unemployment rate is now reaching 10 per cent.
- With 73.5 lakh job losses in April, the number of employees (both salaried and non-salaried) fell from 39.81 crore in March to 39.08 crore in April for the third straight month.
- In April 2020, which was the first full month of the national lockdown last year, the unemployment rate had zoomed to 23.5%.
- Women tend to face a double challenge, with lower labour participation and a higher unemployment rate for females compared with males (for ages above 15).
- For the January-April 2021 period, urban female LPR was 7.2% compared with the urban male’s 64.8%, while urban female unemployment was 18.4% against the urban male unemployment rate of 6.6%, CMIE data showed.

**Causes for the sharp decline in the jobs in India**

- The labour force is the sum of the employed and those unemployed who are seeking employment.
- A shrinking of the labour force is most unusual in an economy with a growing population, and thus a growing working age cohort.
- Low education and lack of skills lead to loss of many job opportunities. On the other hand, the share of young adults in higher education in India has more than doubled over the years.
- Discouraged-worker effect: A section of those hitherto willing to work may have simply dropped out of an already challenged labour market.
- Demonetization has caused demoralisation among a section of the already unemployed who may have given up all hope of finding employment.
- About 90% of Indian Workforce is in the unorganized sector which was majorly affected during Demonetization and GST introduction.
- Declining Capital formation which is not backed by Public and Private Investment.
- Low female LFPR to the tunes of 24% also adds to high unemployment rate.
• Automation and IR4.0 is a looming threat to many jobs which have repeated work or sequential work.

• Socially disadvantaged groups do not get enough exposure in the job market like the general castes and Other Backward Classes.

• Labour laws in India are complex and relatively strict. Employment protection legislation is restrictive, compared with other emerging economies and OECD countries. Thus, corporates in India tend to rely more on temporary contract labour, stay small or substitute labour for capital to avoid strict labour laws.

Measures suggested

• Increase public spending in education:
  o At 3.8% of GDP, public spending on education in India is lower than countries like Brazil and Malaysia.
  o The focus of the government needs to shift to spending on enhancing the quality of education and vocational training.

• Similarly, allowing foreign investment in sectors like legal and accountancy services will create employment as more foreign firms will move to India.

• Infrastructure investment can also be utilised as an engine of job-creation.

• Investing in people through healthcare, quality education, jobs and skills helps build human capital, which is key to supporting economic growth, ending extreme poverty, and creating more inclusive societies.

• Educated unemployment:
  o Besides promoting technical education, the government needs to focus more on creation of jobs and demand for workers since industries are unable to create sufficient job opportunities for all the technically educated people.
  o Policies should ensure that the education systems prepare young people for the skill demands of employers through outreach programmes, training, apprenticeships, and access to job-search assistance measures.
  o More businesses should recognise the opportunity, and need, to invest in young people so that they can help in developing the qualities necessary for education and future employment.
  o NGOs should engage collectively in policy advocacy on youth. They should also partner with companies to develop skills and training programmes to tackle youth unemployment.
  o Singapore has launched certain programmes to establish partnerships between domestic and foreign universities to promote tertiary education. India could learn from such initiatives.
  o New age sectors like defence and aerospace, education and healthcare, and burgeoning green sectors like solar energy and wind, present another massive opportunity to identify ‘upcoming jobs’ and prepare talent accordingly. India’s
ambition to create more than one million new jobs in the green energy sector by 2022 is encouraging.

- **Educated unemployment:**
  
  - There should be cluster development to support job creation in micro, small and medium enterprises (MSMEs). Most of the unorganised sector employment is in MSMEs, which tend to be concentrated in specific geographic locations.
  
  - Private sector leaders should build capacity among unskilled and semi-skilled workers to ensure sustainability of renewable energy projects and provide opportunities to rural communities.
  
  - Government officials should create public training programmes to prepare the poor and less educated people especially semi-skilled and unskilled for employment in the clean-energy sector.
  
  - People need to be made self-employed by providing training in skills and latest technologies for agriculture and other avenues especially in rural areas.
  
  - Women in rural areas who are left behind by men due to migration need to look into other sources of livelihood other than agriculture like animal husbandry etc.

**Conclusion**

In 2020, although the economy was in a very poor state following the deleterious effects of demonetisation, the rural economy was faring reasonably well on the back of two good monsoons. However, after a year of distress, and with some part of the workforce still not having returned to their work places, rural incomes are expected to be under pressure. Economists say they are already seeing signs of sluggishness in rural consumption.

**Value-addition**

**Steps taken by government in recent times**

- **Dedicated Shram Suvidha Portal:** That would allot Labor Identification Number (LIN) to units and allow them to file online compliance for 16 out of 44 labor laws.

- **Random Inspection Scheme:** To eliminate human discretion in selection of units for Inspection, and uploading of Inspection Reports within 72 hours of inspection mandatory.

- **Universal Account Number:** Enables 4.17 crore employees to have their Provident Fund account portable, hassle-free and universally accessible.

- **Apprentice Protsahan Yojana:** Government will support manufacturing units mainly and other establishments by reimbursing 50% of the stipend paid to apprentices during first two years of their training.

- **Revamped Rashtriya Swasthya Bima Yojana:** Introducing a Smart Card for the workers in the unorganized sector seeded with details of two more social security schemes.

- **The National Career Service** is being implemented as a mission mode project to provide various job-related services information on skills development courses, internships etc.
India’s experience with existing free trade agreements has been lukewarm so far, explain the underlying reasons and discuss what should be the way ahead to change this experience into a positive outcome. (250 words)

Level: Moderate
Reference: The Hindu

Why this question:
The article critically examines the India-UK scenario of Free trade agreements and their effects on India’s economy.

Key demand of the question:
India signed a series of Free Trade Agreements (FTA) in Asia that came into force in the 2000s. Across industry and policy-makers, a view has emerged that these FTAs have not served India well and even actively damaged the Indian industry. Thus one has to analyze in detail the aspects of FTAs with respect to the Indian economy.

Directive:
Discuss – This is an all-encompassing directive – you have to debate on paper by going through the details of the issues concerned by examining each one of them. You have to give reasons for both for and against arguments.

Structure of the answer:
Introduction:
In brief, define what FTAs are.

Body:
Explain in what way the success of an FTA should be judged against its objective of enhancing trade. Discuss the factors responsible for such an effect and also suggest what steps should be taken to ensure the better realization of the FTAs.

Conclusion:
Conclude with a way forward.

Introduction
India signed a series of Free Trade Agreements (FTA) in Asia that came into force in the 2000s. Across industry and policy-makers, a view has emerged that these FTAs have not served India well and even actively damaged the Indian industry. Thus, one has to analyze in detail the aspects of FTAs with respect to the Indian economy. Today, India has a total of 14 Free Trade Agreements.

Body
Free Trade Agreement
A free trade agreement is a pact between two or more nations to reduce barriers to imports and exports among them. Under a free trade policy, goods and services can be bought and sold across international borders with little or no government tariffs, quotas, subsidies, or prohibitions to inhibit their exchange.

Reasons for lukewarm outcome of India’s FTA’s

- There are issues related to labour laws and investor protection provisions impact India’s ability to negotiate deep-trade agreements. Deep trade agreements have been designed over the last two decades to facilitate complex global value chains and the underlying trade-investment-services linkages.
  - The predominant focus in these agreements is linked to investor protection, intellectual property rights (IPRs) and labour standards.
India has found it difficult to negotiate these issues in its earlier free trade agreements.

For instance, issues related to labour laws led to the suspension of the FTA negotiations with the EU in 2013 and pushed these negotiations to

- Furthermore, India’s 2016 template for a model investment treaty, may make it difficult for India to negotiate the investor protection provisions. Because it is more state-friendly and includes some burdensome provisions for the foreign investor.

- Next, a protectionist tariff structure, if not corrected, could remain a hurdle at the preliminary stage of FTA negotiations.

- India’s tariff structure has been relatively higher than the average MFN tariffs in the manufacturing sector. For example, As per World Bank data, the applied, weighted mean tariff rate for manufactured products in India increased from 5.5 percent in 2008 to 6.6 percent in 2019. Whereas it decreased in the case of Vietnam from 5.6 percent to 1.4 percent over the same period.

- Exports have not expanded as thought. India’s exports to ASEAN countries amounted to $23 billion in 2010, which increased to $36 billion in 2018, with a compound annual growth rate of five per cent. At the same time, India’s imports from these countries increased from $30 billion in 2010 to $57 billion, a growth of eight per cent.

  - India’s net exports to countries without a trade agreement were only marginally lower than its net exports to countries with FTAs.

  - In contrast, the imports from countries with trade agreements were substantially higher, pushing India into a trade deficit.

- India had recorded a trade deficit in all major trade agreements other than the South Asia Free Trade Agreement (SAFTA).

Way forward and Conclusion

- India should not consider entering into FTAs without preparing the agriculture and manufacturing sectors adequately

- There should be a better alignment/coherence of India’s trade policy with the objectives of other major macroeconomic policies such as National Manufacturing Policy;

- All relevant stakeholders such as business association including bodies representing micro, small and medium enterprises and civil society and community-based organisations should be given due representation in trade policy-making process and its implementation;

- Comprehensive analyses of market access and other opportunities in prospective partner-country markets including analyses of factors relating to enhancement of competitiveness of India’s exports through right mix of import intensity should be undertaken before initiating trade negotiations.

- Negotiations should start after a thorough understanding of sustainability impact of free trade agreements in respect to their economic, social and environmental sustainability;
• **Impact of third-party FTAs** (that is between two or more countries with which India has significant trade relations but does not have a free trade agreement) on the Indian economy should be analysed.

**Value Addition**

**Trade agreements of India**

**FTA’s**

- India – Bhutan Agreement on Trade, Commerce and Transit
- India – ASEAN Trade in Goods Agreement
- India – Japan Comprehensive Economic Partnership Agreement
- India – Malaysia Comprehensive Economic Cooperation Agreement
- India – Singapore Comprehensive Economic Cooperation Agreement (CECA)
- India – South Korea Comprehensive Economic Partnership Agreement (CEPA)
- Revised Indo-Nepal Treaty of Trade
- India– Sri Lanka FTA (ISLFTA) Agreement on South Asian Free Trade Area (SAFTA) (India, Pakistan, Nepal, Sri Lanka, Bangladesh, Bhutan Maldives and Afghanistan)
- India – Thailand FTA – Early Harvest Scheme (EHS)

** Preferential Trade Agreements**

- Asia Pacific Trade Agreement (APTA) (Bangladesh, China, India, Lao PDR, Republic of Korea, and Sri Lanka)
- India – Chile
- India – MERCOSUR
- SAARC Preferential Trading Arrangement
- India – Afghanistan

What is Global Minimum Corporate tax and the rationale behind its announcement? Evaluate the impact that introduction of global minimum tax will have on the Indian economy. (250 words)

**Difficulty level:** Moderate.

**Reference:** [The Hindu](https://www.thehindu.com/)

**Why the question:**
the heads of the world’s major economies — the Group of 20 (G20) nations — approved a new global minimum corporate tax. The deal, announced at the G20 summit in Rome, Italy, is “historic” since this is the first time nearly all nations have agreed to such a system. India needs to prepare for it.

**Key Demand of the question:**
To write about the impact of global minimum tax on the Indian economy.

**Directive word:**
**Evaluate** – When you are asked to evaluate, you have to pass a sound judgement about the truth of the given statement in the question or the topic based on evidence. You must appraise the worth of the statement in question. There is scope for forming an opinion here.

**Structure of the answer:**

**Introduction:**

Begin by defining Global Minimum Corporate tax.

**Body:**

*In the first part, elaborate on the two pillars of Global Minimum Corporate tax and what it seeks to achieve.*

Next, write about the rationale behind its creation – the overcome base erosion and profit shifting, tax evasion, taxation in the country where firms operate etc.

Next, evaluate the potential positive as well as negative impacts of global minimum tax on the Indian economy.

**Conclusion:**

Conclude with a way forward to move towards global minimum tax regime by offsetting its negatives.

**Introduction**

Global Minimum Corporate Tax is a type of corporate tax. Under this, if a company moves some of its operations to another country having low-tax jurisdiction, then the company have to pay the difference between that minimum rate and whatever the firm paid on its overseas earnings. Overall, it is estimated that corporate tax avoidance costs countries around the world $300 to $500 billion in lost revenues each year.

**Body**

The U.S. has sought to impose a global minimum tax on foreign income earned by U.S. corporations. The proposal is perhaps intended to disincentivize American companies from inverting their structures due to the increase in the U.S. corporate tax rate. The proposal is similar to Pillar Two which was the Organization for Economic Co-operation and Development’s (OECD) plan to plug the remaining Base Erosion and Profit Shifting (BEPS) issues.

**Impact of Global Minimum Corporate Tax on India**

- India’s annual tax losses due to corporate tax abuse are estimated at over $10 billion, according to the Tax Justice Network report.

- Although the Equalization Levy addresses the challenges posed by the enterprises that administer their business through digital means, India stands on the same page with the US as far as digital tax issues are concerned.

- Nonetheless, the suggestion of the proposal at such a time is bound to cost more than the benefits accrued for India.

- Multinationals are a source of foreign direct investment. These corporations help to generate demand with efficient utilization of resources and create employment in low-income countries.

- Nations have used their freedom to set corporation tax rates as a way to attract such businesses.

- Smaller countries such as Ireland, the Netherlands and Singapore have attracted footloose businesses by offering low corporate tax rates.
• There’s no need for India to tweak its corporate tax rate, as it is already either on a par with or above the proposed 15% global minimum tax.

• India will get new taxation rights over offshore digital economy companies accessing Indian consumers.

• Moreover, once the deal materializes, India is expected to remove its equalization levy on digital economy firms.

Challenges:

• The proposal impinges on the right of the sovereign to decide a nation’s tax policy.

• Taxation is ultimately a sovereign function, and depending upon the needs and circumstances of the nation, the government is open to participate and engage in the emerging discussions globally around the corporate tax structure.

• A global minimum rate would essentially take away a tool that countries use to push policies that suit them.

• A lower tax rate is a tool they can use to alternatively push economic activity.

• For instance, in the backdrop of the pandemic, IMF and World Bank data suggest that developing countries with less ability to offer mega stimulus packages may experience a longer economic hangover than developed nations.

• The global minimum tax rate will finish off every opportunity for such countries whose only weapon to attract these companies is lower taxes.

• In a world where there are income inequalities across geographies, a minimum global corporation tax rate could crowd out investment opportunities.

• India has already been proactively engaging with foreign governments in double taxation avoidance agreements, tax information exchange agreements, and multilateral conventions to plug loopholes.

• This proposal of a common tax rate, thereby, adds no further benefits to India.

• Also, a global minimum tax rate will do little to tackle tax evasion.

• The deal applies to a very small part of the corporate profits and is also limited to a few companies.

• Experts say the 15% tax rate is not ambitious enough. Earlier this year, UN Financial Accountability, Transparency and Integrity (FACTI) recommended 20-30 per cent global corporate tax.

Conclusion

The World Inequality Report suggested a minimum global tax on MNCs at 25%. MNCs and their shareholders have been the main winners from globalization. Their profits have boomed due to the ever-closer integration of world markets. Therefore, there is need for a socially conscious policymaking that supports equity.
Effects of liberalization on the economy, changes in industrial policy, and their effects on industrial growth.

“Start-ups are the backbone of New India”. In this context, analyze the role played by startups in augmenting the economic image of India. (10M)

Difficulty level: Moderate.
Reference: The New Indian Express

Why the question:
The PM has announced that henceforth, January 16 will be celebrated as National Start-up Day

Key Demand of the question:
To write about the importance of Startups and their role in economic development.

Directive word:
Analyze – When asked to analyze, you must examine methodically the structure or nature of the topic by separating it into component parts and present them in a summary.

Structure of the answer:
Introduction:
Start by explaining what startups are with a few examples and data on how they help in development.

Body:
First, write about the various benefits of startups – Like tackling unemployment, providing affordable services; reduce inequality, involvement of SHG’s, etc.
Next, mention how startups help in augmenting the economic image of India around the world, which leads to an inflow of investment and helps India achieve the 5trillion dollar economy by 2025.

Conclusion:
Conclude by writing a way forward.

Introduction
A startup defined as an entity that is headquartered in India, which was opened less than 10 years ago, and has an annual turnover less than ₹100 crore. Today Startups are being widely recognised as important engines for growth and jobs generation. Through innovation and scalable technology, startups can generate impactful solutions, and thereby act as vehicles for socio-economic development and transformation.

Body

Background
- Recently, Prime Minister of India announced that the country will celebrate January 16 as National Startup Day, as he termed startups the “backbone” of new India and the engine that will power the nation’s economic growth in the run up to the 100th year of Independence.
- National Startup Day is a validation of the role of startups in the growth of the country’s GDP and strengthening India’s position at a global stage, and will encourage young talent to see entrepreneurship as a primary career option, according to industry experts.

Role played by startups in augmenting the economic image of India
- The Indian start-up ecosystem is nothing short of a revolution with $106-billion worth of value-creation by 44 unicorns, in turn creating 4 million direct and indirect jobs.
- Today, India is the third largest start-up ecosystem globally, by number of start-ups, with more than 15,000 start-ups established in 2020, up from 5000 in 2010.
The contribution of startups include by way of large infusion of FDI in an asset class outside of public markets, export of products and services by the country, larger base of retail investors borne out of employees with respectable salaries and wealth creation tools such as ESOPs and being a key consumption market in the global economy.

The total value of private equity and venture capital deals involving new ventures jumped over threefold; nearly $1.7 billion was raised, with as many as 42 deals notched up.

India currently stands third in the global list of the number of companies that have attained unicorn status well behind the US and China, but ahead of the UK and Germany.

Moreover, women entrepreneurs have also contributed immensely to the start-up ecosystem.

Ancillary industries rise up creating more avenues of innovation, growth and employment.

The unicorns like ola, flipkart which are consumer centric have created an alternate gig economy for workers, which gives them much needed flexibility.

Due to competition among unicorns, consumers are benefited through competitive pricing.

It has created an ecosystem in cities such as Bengaluru and Delhi, which has paved way for more capital and investments flowing into the nation.

Conclusion

Startups in India are witnessing a golden chapter in the history of Indian entrepreneurship. However, still the Indian government has a crucial role to play in positioning India as the Tech Garage of the World. It should act as a catalyst, and bring together the synergies of the private sector with the aim of innovating for India and the world. Recognising the startup sector with a dedicated observational day will definitely help build awareness about the sector and also draw great talent and investment into this sector.

India is harnessing the fruits of its start-up ecosystem as it is witnessing a unicorn revolution. However, regulators need to find the right balance to ensure these promising start-ups grow but in an efficient and transparent manner. Comment. (250 words)

Difficulty level: Moderate
Reference: New Indian Express

Key Demand of the question:
To suggest ways to have a proper regulation of start-ups in India to ensure their sustainable growth.

Directive:
Comment – here we must express our knowledge and understanding of the issue and form an overall opinion thereupon.

Structure of the answer:
Introduction:
Begin by throwing light on the unicorn revolution in India.

Body:
First, mention how the unicorn revolution in India is the outcome of the quick growth of start up ecosystem and outcome of policy support to it.
Next, mention the various regulatory and governance related issue with respect to start-ups in India.
Mention the impact of misgovernance of start-ups on Indian economy and start-up ecosystem.
Suggest measures to overcome them.
**Conclusion:**
Conclude with a way forward.

**Introduction**

In the venture capital industry, the term **unicorn refers** to any startup that reaches the **valuation of $1 billion. The term was first coined by venture capitalist Aileen Lee in 2013.** Mostly, all the unicorns have brought a disruption in the field they belong to. Uber, for example, changed the way people commuted. Airbnb changed the way people planned their stay while travelling and Snapchat disrupted the usage of the social media network etc.

**India currently stands third** in the global list of the number of companies that have attained unicorn status.

**Body**

**Benefits of a unicorn**

- The Indian start-up ecosystem is nothing short of a revolution with $106-billion worth of value-creation by 44 unicorns, in turn creating **1.4 million direct and indirect jobs.**
- Start-ups have helped **women entrepreneurs** to contribute immensely to the start-up ecosystem
- It’s increasingly seen as a sign that the Indian economy is reaching a turning point and that its **entrepreneurial culture is maturing.**
- **Ancillary industries** rise up creating more avenues of innovation, growth and employment.
- The unicorns like ola, flipkart which are consumer centric have **created an alternate gig economy for workers,** which gives them much needed flexibility.
- Due to competition among unicorns, consumers are benefited through competitive pricing.
- It has created an ecosystem in cities such as Bengaluru and Delhi, which has paved way for more capital and investments flowing into the nation.

**Challenges faced by unicorns in India**

- **Capital:** For running a company from being startup to unicorn, a significant amount of working capital is required. Many startups, especially at early stages, are bootstrapped, i.e. self-funded through the founders’ own savings, or using capital from friends and family.
- **Complex regulatory environment:** The government of India has introduced policies that aim to ease the business environment for startups.
  - However, **the present regulatory framework** in which startups/unicorns operate is widely seen as **difficult, inefficient and unpredictable.**
- **Bureaucratic process:** Companies in India often feel encumbered by bureaucratic processes, which **appear to lack underlying standards.**
  - They have insufficient possibilities to find information, and there is little planning security about how long processes can take.
  - In addition, regulations can suddenly change or startups receive random notices.
As a result, startups have to find frustrating workarounds, waste valuable time or pivot their business model.

- A further challenge for startups is to take their products to the market as Indian markets appear difficult to penetrate.
  - Competitive landscape: Often, many firms are already present and many more enter the market, including copycats.
  - A second reason is that startups are at a disadvantage compared to large companies.
  - Huge uncertainty: Recently, the biggest-ever initial public offering (IPO) in India fell flat on its face on the first day of its listing in the stock exchange, with shares being traded at prices less than 27% of the IPO price.

- On the one hand, this is due to the fact that big market players are more capable of dealing with bureaucratic regulations.
  - On the other hand, public procurement is seen as weak and government prefers to sign contracts with established companies.

- For many job-seekers, joining a startup as an employee is not an attractive career option, due to the inherent risk that the startup might fail.

Need for proper regulatory mechanism

- The factors enabling the rise of unicorns comprise the availability of private equity funds, increasing Internet penetration and digital payments, more robust infrastructure and the rising pool of skilled talent.

- Considering the focus on creating an Aatmanirbhar Bharat, however, the nation’s policymakers, risk-taking corporates and funding agencies need to foster a conducive climate for ensuring easier availability of domestic capital.

- As business models get more complex and interlinked, the regulators have to play a more proactive role in formulating appropriate regulations that encourage innovation and support emerging business models rather than hindering innovation.

- Besides promoting local funding, the government and corporate entities may need to invest in a big way through leading academic institutions to de-risk start-up investments in the long run.

- It appears that corporations and valuation experts overestimate the Indian economy’s potential to consume services by assuming exponential demand growth over longer time periods.

- Firms spend a lot of money to offer huge discounts to clients in the hopes that people would become so used to these platforms that they will continue to use them even if the prices are raised. This could lead to cartelization and market monopoly on a long run.

Conclusion

By providing the “minicorns” (a start-up with $1 million-plus valuation) and “soonicorns” (funded by angel investors or venture capitalists and likely to soon join the unicorn club) the right regulatory ambience and local sources of funding, India can create a truly innovative and resilient economy.
**Government Budgeting.**
How does fiscal deficit impact the Indian economy? Suggest measures to overcome the fiscal deficit created by the impact of the pandemic. (250 words)

**Difficulty level: Easy.**

**Reference:** Indian Express

**Why the question:** The last budget had presented a roadmap for fiscal consolidation, projecting to bring down the fiscal deficit from 9.5 per cent of GDP in 2020-21 to 6.8 per cent in 2021-22, and thereafter, to below 4.5 per cent by 2025-26.

**Key Demand of the question:** To write about the impact of fiscal deficit and the steps to overcome it.

**Structure of the answer:**

**Introduction:**
Begin by defining fiscal deficit.

**Body:**
In the first part, give the context of pandemic and increased fiscal deficit due to it. Next, write about the impact of fiscal deficit – price stability and inflation, push up overall demand in the economy, raising the cost of inputs, ‘crowding out’ effect etc. Next, suggest policy measures to overcome the above.

**Conclusion:**
Conclude with a way forward.

**Introduction**

**Fiscal Deficit** is a term used to denote a deficit in government earnings during a financial year. A fiscal deficit occurs when the total expenditure of the government exceeds the total revenue (excluding borrowed funds). Fiscal deficit is “reflective of the total borrowing requirements of Government”.

The last budget had presented a roadmap for fiscal consolidation, projecting to bring down the fiscal deficit from **9.5 per cent of GDP in 2020-21 to 6.8 per cent in 2021-22**, and thereafter, to **below 4.5 per cent by 2025-26**.

**Body:**

**Fiscal Deficit:**

- The difference between total revenue and total expenditure of the government is termed as fiscal deficit.
- It is an indication of the total borrowings needed by the government.
- Generally fiscal deficit takes place either due to revenue deficit or a major hike in capital expenditure.
- Capital expenditure is incurred to create long-term assets such as factories, buildings and other development.

**Significance of fiscal deficit:**

- In the economy, there is a limited pool of investible savings. These savings are used by financial institutions like banks to lend to private businesses (both big and small) and the governments (Centre and state).
- If the fiscal deficit ratio is too high, it implies that there is a lesser amount of money left in the market for private entrepreneurs and businesses to borrow.
Lesser amount of this money, in turn, leads to higher rates of interest charged on such lending.

So, simply put, a higher fiscal deficit means higher borrowing by the government, which, in turn, mean higher interest rates in the economy.

A high fiscal deficit and higher interest rates would also mean that the efforts of the Reserve Bank of India to reduce interest rates are undone.

**Impacts of Fiscal Deficit:**

- It can mean that the Government is spending money on unproductive programmes which do not increase economic productivity. (For example MNREGA, most of the money is eaten midway by the Sarpanch and Local officers.)

- As government borrows from RBI which meets this demand by printing of more currency notes (called deficit financing), it results in circulation of more money. This may cause **inflationary pressure in the economy**.

- When Government keeps borrowing and borrowing to fill up the fiscal deficit pothole, then bond yield will increase. It is not good because more and more of taxpayers’ money (i.e. Government ‘s incoming money) will go in repaying that bond interest rate rather than going into education or healthcare.

- Government may be compelled to borrow to finance even interest payment leading to emergence of a **vicious circle and debt trap**.

- Fiscal deficit “Crowds out” investment from private sector as Government borrows most of the cash.

- Borrowing is in fact financial burden on future generation to pay loan and interest amount which retards growth of economy.

**Strategies to Reduce Fiscal Deficit:**

- There is a need to implement **NK Singh committee recommendations** with respect to Fiscal deficit for a stable economy.
  - Suggested a fiscal deviation band of 0.5%.
  - This means that the government can deviate by 0.5% from the fiscal Deficit target if the economy is in slowdown.
  - The flexibility has been allowed for the government to create space for stimulus to pump-prime the economy.

- On the other hand, when the economy is doing well, the deficit can be compressed by 0.5%.

- A deficit is usually financed through borrowing from either the central bank of the country or raising money from capital markets by issuing different instruments like treasury bills and bonds.

- A drastic reduction in expenditure on major subsidies. Reduction in expenditure on bonus, LTC, leaves encashment, etc. Austerity steps to curtail non-plan expenditure.
Tax base should be broadened and concessions and reduction in taxes should be curtailed. Tax evasion should be effectively checked. More emphasis on direct taxes to increase revenue. Restructuring and sale of shares in public sector units.

Famous economist John Maynard Keynes opined that deficits actually assist nations in climbing out of economic recessions.

However, fiscal conservatives believe that deficits should be avoided by the government which should be inclined towards a balanced budget policy.

Conclusion:
For better economic management and long term economic growth other factors and measures should be considered along with fiscal deficit. In the current scenario, the most important thing is to bring back confidence among consumers as well as businesses. This will help in fuelling the economic recovery.

Inclusive growth and issues arising from it.
Examine as to how the pandemic has further exacerbated economic inequalities in the country and suggest measures to overcome the same. (250 words)

Difficulty level: Moderate.
Reference: Indian Express

Why the question:
Since the onset of the pandemic, there has been growing concern over the extent to which income and wealth disparities have widened in the country during this period.

Key Demand of the question:
To write about the impact of pandemic on inequalities and measures to overcome it.

Directive:
Examine – When asked to ‘Examine’, we must investigate the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications.

Structure of the answer:
Introduction:
Begin the answer by stating a fact highlighting growing inequalities due to the pandemic.

Body:
In the first part, write the about how the pandemic has further exacerbated economic inequalities in the country – The rising unemployment rate, increasing casualisation of the workforce, rising dependence on MGNREGA and financial distress among MSMEs, when seen against the booming profits of large firms, a soaring stock market, and the vaulting fortunes of the rich. Give facts and examples to substantiate.

Next, write about the measures that are needed to combat the same and reduce the growing inequalities.

Conclusion:
Conclude by writing a way forward.

Introduction
The COVID-19 pandemic has exposed the stark divide between the rich and the poor. At this juncture, evaluating the state of inequality serves as an eye-opener on the income/wealth divides prevailing across regions. Such divides are represented in terms of the share of income/wealth among the top 10% of the population against the bottom 50% of the population. Rising inequality of
wealth and income across countries has been pointed out by the latest edition of the World Inequality Report.

Body

Growing inequality due to Covid-19

- Inequalities were increasing earlier also but the pandemic has widened them further. For example, the share of wages declined as compared to that of profits. The big companies and a large part of the corporate sector could manage the pandemic.

- But the informal sector and workers have suffered a lot with loss of incomes and employment in the last one year. In other words, the recovery is more k-shaped with rising inequalities.

- A new survey carried out by People’s Research on India’s Consumer Economy (PRICE), a think tank, attempts to fill the void.

- As reported in this paper, data gathered in the survey indicates that the annual income of the poorest 20 per cent of households in India declined by around 53 per cent in 2020-21 compared to levels observed in 2015-16.

- In comparison, incomes of the top 20 per cent households grew by 39 per cent over the same period.

- A consequence of this divergence is that the richest 20 per cent of households (the top quintile) accounted for 56.3 per cent of total household income in 2021, up from 50.2 per cent in 1995.

- At the other end of the spectrum, the share of the bottom 20 per cent of households declined from 5.9 per cent to 3.3 per cent over the same period.

- Women lost more jobs and many are out of the workforce. Inequalities have increased in health care and education.

- In its latest report, Oxfam noted “The wealth of Indian billionaires increased by 35 per cent during the lockdown and by 90 per cent since 2009 to $422.9 billion ranking India sixth in the world after US, China, Germany, Russia and France,” in its report titled ‘The Inequality Virus’.

- Multiple estimates by multilateral institutions show the COVID-19 pandemic will hit India the hardest by sending 40 million people into “extreme poverty”, worsen hunger and income inequality, and yet the government seems oblivious with no data, no estimation or policy response

- The United Nations Development Programme (UNDP) estimates that 260 million people will be back in poverty by 2020 – almost as many as the 271 million who left between 2006 and 2016.

Measures to address the inequalities

A three-pronged approach for reducing inequalities. These are: focus on employment and wages; raising human development, and quasi universal basic income and other social safety nets.
First, creation of quality or productive employment is central to the inclusive growth approach. At the macro level, the investment rate which declined from 39% in 2011-12 to 31.7% in 2018-19 has to be improved. Investment in infrastructure including construction can create employment.

In labour market, correcting the mismatch between demand and supply of labour is needed (only 3% of India’s workforce has formal skill training as compared to 96% in South Korea, 80% in Japan, and 52% in the United States).

Manufacturing should be the engine of growth. Here, labour-intensive exports are important and manufacturing and services are complementary.

Focusing on micro, small & medium enterprises and informal sectors including rights of migrants is important rather than providing 75% reservation to locals in private jobs.

Getting ready for automation and technology revolution such as IR 4.0. Workers need to be reskilled and up-skilled.

Social security and decent working conditions for all; raising real wages of rural and urban workers and guaranteeing minimum wages are key to reducing inequality.

Apart from spending on vaccines and other related measures, we need to move towards universal health care and spend 2%-3% of GDP on health. Education and health achievements are essential for reducing inequality of opportunities.

Way Forward

- Enhancing tax and non-tax revenues of the government is needed to spend on the above priorities.
- The tax/GDP ratio has to be raised, with a wider tax base. Richer sections have to pay more taxes.
- Similarly, the inequalities between the Centre and States in finances should be reduced. State budgets must be strengthened to improve capital expenditures on physical infrastructure and spending on health, education and social safety nets.
- Apart from economic factors, non-economic factors such as deepening democracy and decentralisation can help in reducing inequalities.
- Unequal distribution of development is rooted in the inequalities of political, social and economic power. We have to find opportunities and spaces where the power can be challenged and redistributed.

How can India balance achieving its developmental ambitions as well as its pledge of net zero emissions by 2070? What are the changes needed in its industrial policy in this regard? (250 words)

Difficulty level: Moderate
Reference: The Hindu
Why the question:
For climate and development’s sake, India needs to bring back a different industrial policy.

**Key Demand of the question:**
To write about the benefits and potential Digital Public Goods in India.

**Structure of the answer:**
**Introduction:**
Begin by giving context to India’s net zero declaration at cop-26.

**Body:**
First, in brief, mention India’s needed to balance both its development as well as its climate goals. Bring out the link between the two.
Next, write about the changes required to India’s industrial policy in this regard – A green industrialisation strategy in the with short-, medium- and long-terms. Write about the various components that need to included in this.

**Conclusion:**
Conclude by writing a way forward.

**Introduction**
Climate change is one of the defining challenges of this century. Without a global effort to rapidly reduce greenhouse gas emissions, average global temperatures are very likely to exceed 2°C even with current policies in place. While many developing countries made net-zero pledges at COP26 in Glasgow, they face enormous developmental challenges in their attempts to grow in a climate-constrained world.

In Glasgow, Prime Minister Narendra Modi announced that India will strive to reach net-zero emissions by 2070.

**Body**

**Existing challenges for India: Balancing climate goals and development**

- For India, the national context is shaped by high youth unemployment, millions more entering the workforce each year, and a country hungry for substantial investments in hard infrastructure to industrialise and urbanise.

- Unlike the energy-intensive growth trajectories of the industrialised world, and rapidly industrialising economies like China, India’s economic growth in the last three decades, led by growth in the services sector, has come at a significantly lower emissions.

- But in the coming decades, India will have to move to an investment-led and manufacturing-intensive growth model to help lift hundreds of millions more out of poverty.

- India needs to create job opportunities for another 300 million expected to enter the workforce by mid-century, and create entirely new cities and infrastructure to accommodate and connect an increasingly urban population. All of this requires a lot of energy.

- Amidst this, India’s challenge is to achieve net-zero emissions by 2070. With the mammoth task of industrialisation that is needed, the climate goal can be challenging.

**Strategy India needs with respect to Industrialisation**

- **Comprehensive strategy:** What India needs is an overarching green industrialisation strategy that combines laws, policy instruments, and new or reformed implementing institutions to steer its decentralised economic activities to become climate-friendly and resilient.
• **Private investment**: A market-steering approach rather than a hands-off approach would encourage patient private sector investments in technologies needed to industrialise under climate constraints.

• **Nurture private green entrepreneurship**: India also needs to nurture private entrepreneurship and experimentation in clean energy technologies rather than be indifferent to it as we are today or stifle it as we did in the License Raj era.

• **Green transport**: Technologies needed to decarbonise the transport and industry sectors provide a significant opportunity. However, India’s R&D investments in these emerging green technologies are non-existent. The production-linked incentives (PLIs) under ‘Aatmanirbhar Bharat’ are a step in the right direction for localising clean energy manufacturing activities.

• **Quantum jump**: Aligning existing RD&D investments with the technologies needed for green industrialisation is crucial for realising quantum jumps.

**Way forward and conclusion**

• There should be no doubt that India’s energy transition should be squarely development-focused and aim to extract economic and employment rents from decarbonisation.

• The government should neither succumb to international pressure to decarbonise soon nor should it postpone its investment in decarbonisation technologies and lose its long-term competitiveness in a global low-carbon economy.

• Instead, India should set its pace based on its ability to capitalise on the opportunities to create wealth through green industrialisation.

• India should follow a path where it can negotiate carbon space to grow, buying time for the hard-to-abate sectors; push against counterproductive WTO trade litigations on decarbonisation technologies; all while making R&D investments in those technologies to ensure that it can gain economic value in the transition.

• This will not only make India a responsible power but also make its economy competitive in a climate-constrained world.

**Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.**

What is the Minimum Support Price (MSP) system for agricultural commodities in India? Is MSP System helping the farmers, or is failing them? Critically examine (250 Words)

**Difficulty level: Moderate**

**Reference: The Indian Express, GaoConnection**
Why the question:
The article is by renowned agriculture expert Ashok Gulati. He explains the negative impact of the MSP system in India as well as suggests measures to reform it.

Key Demand of the question:
Explain the MSP system, how has it been helpful for the farmers as well as issues associated with it.

Directive word:
Critically examine – When asked to ‘Examine’, we have to look into the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications. When ‘critically’ is suffixed or prefixed to a directive, one needs to look at the good and bad of the topic and give a fair judgment.

Structure of the answer:
Introduction:
Give a brief introduction of the MSP system followed in India

Body:
Give a brief description of how MSP system has helped safeguard the interest of the farmers in India. Then go on to detail the issues with the MSP system e.g. MSP distorts the basic logic of the supply-demand mechanism, slows down the process of diversification, and is economically a very expensive and inefficient policy instrument, besides leading to massive leakages and corruption. Briefly list down some of the suggestions to reform the system especially the call by some to legalise the MSP system.

Conclusion:
Conclude with a balanced viewpoint and need for further reforms in MSP system.

Introduction
Minimum Support Price (MSP) is the rate at which the government buys grains from farmers. Currently, it fixes MSPs for 23 crops grown in both Kharif and Rabi seasons. The government recently hiked the MSP for wheat by Rs. 40 to Rs. 2,015 per quintal and for mustard seed by Rs. 400 to Rs. 5,050 per quintal for the current crop year in order to boost crop area as well as income of farmers.

Body
Yes, MSP helps farmers to an extent

- MSP has been beneficial in transferring incomes to rural areas and to counter farm level inflation.
- It can also counter the agricultural distress brought on by natural hazards in the country. It gives farmers hope of earning more in the new sowing season.
- In the last few years, India has become a net importer of pulses. Massive hike in the MSP of these crops will encourage the farmers to grow nutritional crops. It will help in changing the cropping pattern which was long due.
- A higher MSP regime will also help in achieving the Government’s target of doubling farmer’s income by 2022.
- It also acts as an incentive for farmers to produce the crop which is in short supply.
- Higher profits for the farmer will also help them to invest in necessary infrastructure and equipment.
- The MSP to some extent will protect the farmer by guaranteeing a minimum floor price so that they can plan in advance for the next season.
However, MSP fails the farmers more

The trouble with MSP is that while it is touted as an all-important factor for farmers promising an instant rise in their income and stability, it also has many drawbacks in implementation. This affects the price realisation of farmers, in reality for several reasons.

- **Methodology:** MSP covers numerous costs such as the cost of sowing (A2) and labour (FL). These considerations are controversial with suggestions that it should be based on comprehensive costs (C2), which also include land rent costs.

- **Inflation:** Too much of a hike on MSP either paves way for inflationary effects on the economy, with a rise in prices of food grains and vegetables, or loss to government treasury if it decides to sell at a lower price as compared to the higher MSP it bought at.

- **Diverse factors:** MSP is a nationwide single price policy. However, the actual costing for production varies from place to place, more severely so in areas lacking irrigation facilities and infrastructure. Thus, not all farmers have equal benefits.

- **Procurement at MSP is flawed:** First, procurement of wheat and paddy for meeting the requirement of the public distribution system (PDS) is undertaken largely by state governments.
  
  - Of the total procurement of wheat and paddy from farmers, the Food Corporation of India’s (FCI’s) share is less than 10%.
  
  - In the north-east and many other states, procurement operations are almost nonexistent and farmers are forced to sell below MSP.

  - As the experiences of these schemes show, the benefit of higher MSPs for kharif crops or rabi, is unlikely to be available to most farmers as the states lack adequate storage capacity, working capital and manpower for undertaking large-scale procurement of all commodities.

  - The MSP-based procurement system is also dependent on middlemen, commission agents and APMC officials, which smaller farmers find difficult to get access to.

- **Agri-Infrastructure:** Hiking the MSP without investing in infrastructure is just a short-term play. While it does deliver immediate results, long-term developments to back-it up are also important.

- **Environmental harm:** It degrades the soil because of irrespective of the soil condition, some crops are preferred which have MSP over them which results in exploitation of group water resources, alkalinity, decrease in the production of the crops in long run and much harm to environment.

**Conclusion**

The government should shift its focus from providing only price support to farmers and focus on building better infrastructure, minimizing the gap between farmers and the market, land reforms, policy reforms to increase flow of credit to farmers, establishing food-processing industries for perishable goods, providing better irrigation facilities etc so, that agriculture emerges as a viable means of sustenance.
Food processing and related industries in India- scope and significance, location, upstream and downstream requirements, supply chain management.

With the bourgeoning urban and young population, demand for processed food items is set to increase in the coming years. The food processing industry in India needs to gear up to meet the demand by investing in necessary infrastructure. Examine. (250 words)

Difficulty level: Moderate.
Reference: The Hindu

Key Demand of the question:
To write about the steps that are needed to harness India’s food processing potential.

Directive word:
Examine – When asked to ‘Examine’, we must investigate the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications.

Structure of the answer:
Introduction:
Begin by giving a statistic about current status of food processing industry in India.

Body:
First, in detail, write about the scope for food processing in India – youth population, growing demand, its suitability, sustained agricultural production etc.

Next, write about the steps that must be take by the food processing industry to step up to realise its potential.

Conclusion:
Conclude by writing a way forward.

Introduction

Food processing generally includes the basic preparation of foods, the alteration of a food product (usually raw) into another form (as in making preserves from fruit), and preservation and packaging techniques. Food processing typically takes harvested crops or animal products and uses these to produce long shelf-life food products.

It includes the process of value addition to produce products through methods such as preservation, addition of food additives, drying etc. with a view to preserve food substances in an effective manner, enhance their shelf life and quality.

The challenge to feed the 10 billion population by mid-century is a daunting challenge across the globe.

Body:

Scope of FPI in India:

- India is the world’s second largest producer of fruits & vegetables after China but hardly 2% of the produce is processed.
India is among the top 5 countries in the production of coffee, tobacco, spices, seeds etc. With such a huge raw material base, we can easily become the leading supplier of food items in the world.

In spite of a large production base, the level of processing is low (less than 10%). Approximately 2% of fruits and vegetables, 8% marine, 35% milk, 6% poultry are processed. Lack of adequate processable varieties continues to pose a significant challenge to this sector.

**Economic Survey 2020**: During the last 6 years ending 2017-18, Food Processing Industries sector has been growing at an average annual growth rate of around 5.06 per cent.

- **Employment**: According to the Annual Survey of Industries for 2016-17, the total number of persons engaged in registered food processing sector was **54 lakhs**. (whereas unregistered FPOs supports **51.11 lakh** workers)

- **Farmer Beneficiaries**: The SAMPADA scheme is estimated to benefit about 37 lakh farmers and generate about **5.6 lakh direct/ indirect employment** (ES 2020 data).

- **Curbing Distress Migration**: Provides employment in rural areas, hence reduces migration from rural to urban. Resolves issues of urbanization.

**Challenges facing food processing industry in India**

- Demand of processed food is mainly restricted to urban areas of India.

- Major problems are listed below:
  - Small and dispersed marketable surplus due to fragmented holdings
  - Low farm productivity due to lack of mechanization,
  - High seasonality of raw materials
  - Perishability and lack of proper intermediation (supply chain) result in lack of availability of raw material.
  - This in turn, impedes food processing and its exports.

- More than 30% of the produce from farm gate is lost due to inadequate cold chain infrastructure.

- The NITI Aayog cited a study that estimated annual post-harvest losses close to Rs 90,000 crore.

- Lack of all-weather roads and connectivity make supply erratic.

- The food processing industry has a high concentration of unorganised segments, representing almost 75% across all product categories. Thus, causes the inefficiencies in the existing production system.

- Further, most processing in India can be classified as primary processing, which has lower value-addition compared to secondary processing.
Due to this, despite India being one of the largest producers of agricultural commodities in the world, agricultural exports as a share of GDP are fairly low in India relative to the rest of the world.

Solutions to address the challenges

- The Ministry of Food Processing Industries (MoFPI) is implementing **PMKSY (Pradhan Mantri Kisan SAMPADA Yojana)**. The objective of PMKSY is to supplement agriculture, modernize processing and decrease agri-waste.
  - Mega Food Parks.
  - Integrated Cold Chain, Value Addition and Preservation Infrastructure.
  - Creation/Expansion of Food Processing/Preservation Capacities.
  - Infrastructure for Agro Processing Clusters.
  - Scheme for Creation of Backward and Forward Linkages.

- **Foreign Direct Investment (FDI) policy**: FDI up to 100%, under the automatic route is allowed in food processing industries.

- **Agri Export Zones**: To give thrust to export of agro products, new concept of Agri Export Zones was brought in 2001. APEDA has been nominated as the Nodal Agency to coordinate the efforts.
  - cluster approach of identifying the potential products;
  - the geographical region in which these products are grown;
  - Adopting an end-to-end approach of integrating the entire process right from the stage of production till it reaches the market (farm to market).

Conclusion

Food processing has a promising future, provided adequate government support is there. Food is the biggest expense for an urban Indian household. About 35% of the total consumption expenditure of households is generally spent on food. As mentioned, food processing has numerous advantages which are specific to Indian context. It has the capacity to lift millions out of undernutrition. Government has its work cut out to develop industry in a way which takes care of small scale industry along with attracting big ticket domestic and foreign investments.

**Infrastructure: Energy, Ports, Roads, Airports, Railways etc.**

“Investment in infrastructure is essential for more rapid and inclusive economic growth. “Discuss in the light of India’s experience. (Answer in 250 words)

**Reference**: Indian Express

**Why the question:**
The question was asked in this year’s UPSC GS3 a week back.

**Key Demand of the question:**
Discuss the need to focus on infrastructure development, both physical and social, as this would have a multiplier effect on the economy.

**Directive:**
Discuss – This is an all-encompassing directive – you have to debate on paper by going through the details of the issues concerned by examining each one of them. You have to give reasons for both for and against arguments.

**Structure of the answer:**
**Introduction:**
Start with key data on the current status of infrastructure in the country.

**Body:**
Give a brief outline of India’s Infrastructure journey (e.g. key schemes of the government and its benefits).
Discuss briefly the challenges India is facing.
Then in detail give how investment in infrastructure will bring about economic and inclusive growth e.g. creation of jobs, more entrepreneurship, increasing value of assets and thus income, benefits for farmers, etc.

**Conclusion:**
Conclude with the way forward.

**Introduction**
Infrastructure sector is a key driver for the Indian economy. The sector is highly responsible for propelling India’s overall development and enjoys intense focus from Government for initiating policies that would ensure time-bound creation of world class infrastructure in the country.

Infrastructure sector includes power, bridges, dams, roads, and urban infrastructure development.

Basic infrastructure facilities in the country provide the foundation of growth. In the absence of adequate infrastructure, the economy operates at a suboptimal level and remains distant from its potential and frontier growth trajectory.

**Body**

**Background**
The infrastructure sector will be the key to overall economic growth and macroeconomic stability, the Survey said emphasising that the year after the crisis (2021-22) will require sustained and calibrated measures to facilitate the process of economic recovery and enable the economy to get back on its long-term growth trajectory.

**Investment in infrastructure is essential for more rapid and inclusive economic growth**

- **Foundation for growth:**
  - Basic infrastructure facilities in the country provide the foundation of growth.
  - In the absence of adequate infrastructure, the economy operates at a suboptimal level and remains distant from its potential and frontier growth trajectory.

- **Increases employment:**
  - Infrastructure development such as road construction, real estate, railway construction, etc. is labour intensive, leading to increase in employment opportunities in formal and informal sectors and thus, fuelling domestic demand.
• Raises Farmer’s Income:
  o Investment in infrastructure would play critical role in ensuring doubling of farmers income through focus on increased irrigation infrastructure and storage, processing and marketing infrastructure.

• Health and Well-being:
  o Infrastructure development of superior healthcare facilities, electronic health records and better equipped health infrastructure at primary levels. (Telemedicine)

• Reduces Logistic Cost:
  o Building world class roads, railways, ports, inland water ways, will cut down logistic costs and improve competitiveness and promote exports.
  o This would bring more revenues to government and may promote socio-economic development.

Way forward

• Rs 111 trillion National Infrastructure Pipeline for 2020-2025 will be a game-changer for the Indian economy. Sectors like energy, roads, urban infrastructure, railways have a lion’s share in it that will help boost growth.

• To boost private investment in infra sector, it said the government has set up the Public Private Partnership Appraisal Committee (PPPAC) for appraisal of PPP projects.

• Revamping of the proposed VGF scheme will attract more PPP projects and facilitate the private investment in social sectors (Health, Education, Waste Water, Solid Waste Management, Water Supply etc.)

• The Aatmanirbhar Bharat has brought manufacturing at centre stage and emphasized its significance in driving India’s growth and creating jobs.

A push towards logistics, prioritizing government measures to reduce India’s extremely high logistics costs, plethora of regulations, poor connectivity and distribution challenges is the current need of the hour. Elucidate (250 words)
Begin by giving a statistic about high cost of logistics in India.

Body:
First, mention the impact of high cost of logistics on the Indian economy.
Next, analyze how regulations, poor connectivity and distribution challenges are detrimental to India’s developmental ambitions.
Next, suggest steps to overcome the same and reduce the bottlenecks.

Conclusion:
Conclude by writing a way forward.

Introduction
The Indian logistics sector is a sunshine industry and is going through a phase of transformation on account of various reform initiatives and policy changes. India’s fast-growing logistics sector is expected to reach $350 billion of market size by 2025. But the highly fragmented sector suffers from a plethora of regulations, poor connectivity and distribution challenges.

Body

Background

- The National Logistics Policy being formulated by the Commerce Department is touted to improve India’s trade competitiveness, create more jobs, improve India’s performance in global rankings and pave the way for India to become a logistics hub.

- The policy will create a single-window e-logistics market, aim to double the employment in the sector currently pegged at 22 million, and make MSMEs competitive.

Need for push towards logistics

- Huge Potential
  - Providing livelihood to more than 22 million people, it encompasses nearly 10,000 commodities, 200 shipping agencies, and 36 logistics services.
  - Further, permission from 81 authorities and more than 500 certifications, are required for exports.
  - Nearly 129 Internal Container Depots, 168 Container Freight Stations, along with 50 IT ecosystems, banks, and insurance agencies are also part.
  - According to consulting firm Redseer, it is estimated that India’s logistics market is around $209 billion as of 2022. Seeing sharp growth year-on-year, this is set to rise to $350 billion by 2025.

- A strong logistics ecosystem will reduce the logistics cost from the present 14 percent of GDP to less than 10 percent in the next 3 years.

- A government study has estimated that facilitating a 10 percent decrease in indirect logistics costs will directly translate to a growth of 5-8 percent in exports.

- Reduction in logistics costs will result in more competitive goods and services, resulting in more trade and commerce for India.

- Focus on new technology, improved investment, skilling, removing bottlenecks, improving inter modal transportation, automation, single window system for giving clearances, and simplifying processes.
• Improving logistics sector has huge implication on exports and it is estimated that a 10 per cent decrease in indirect logistics cost can increase 5-8 per cent of exports.

• The need of the hour is to formulate an integrated logistics policy.

• Better performance in logistics will augment programmes like Make in India, and also enable India to become an important part of the global supply chain.

• Such measures will also contribute to creation of a New India by 2022

**Impediments in the path**

• Logistics sector currently is less automated.

• Over 70 per cent of the logistics sector is in small, unorganised hands.

• India’s logistics costs are 40 per cent higher than in most developed countries.

• High cost of logistics impacting competitiveness in domestic and global market.

• Underdeveloped material handling infrastructure and fragmented warehousing.

• Presence of multiple regulatory and policy making entities.

• Lack of seamless movement of goods across modes.

• Poor integration with modern information technology

**Conclusion**

A mechanism needs to be created to measure the sector’s performance at regular intervals. The immediate need of the hour is to announce new measures to be undertaken as part of the National Logistics policy that has been in the making for more than 3-years now.

**Science and Technology**

- developments and their applications and effects in everyday life; Achievements of Indians in science & technology; indigenization of technology and developing new technology.

Compare and contrast James Webb Telescope with that of Hubble Telescope. What insights can James Webb Telescope offer about our past? (250 words, 15 marks)

**Introduction**

The world’s most powerful space telescope – James Webb Telescope (JWT) blasted off into orbit, headed to an outpost 1.5 million kilometers (930,000 miles) from Earth, after several delays caused by technical hitches. Named after a former NASA director, Webb follows in the footsteps of the legendary Hubble — but intends to show humans what the Universe looked like even closer to its birth nearly 14 billion years ago. Though Webb is often called the replacement for the Hubble Space Telescope (HT), NASA said it prefers to call it a successor.

**Body**

**Comparison between JWT and HT**

• **Wavelength:**
The James Webb Space Telescope, carrying four scientific instruments, will observe primarily in the infrared range and provide coverage from 0.6 to 28 microns.

The instruments on Hubble see mainly in the ultraviolet and visible part of the spectrum. It could observe only a small range in the infrared from 0.8 to 2.5 microns.

- **Size comparisons**
  - Webb’s primary mirror has a diameter of 6.5 metres. Hubble’s mirror was much smaller – 2.4 metres in diameter.
  - So, Webb will have a larger field of view compared to the camera on Hubble.
  - Webb also carries a large sun shield measuring about 22 metres by 12 metres – about the size of a tennis court.

- **Orbit**
  - Hubble orbits around the Earth at an altitude of ~570 km.
  - Webb will not orbit the Earth.
  - It will orbit the sun at about 1.5 million kilometres away from Earth.
  - As the Earth orbits the Sun, Webb will orbit with it – but it will stay fixed in the same spot with relation to the Earth and the Sun.

- **How far can they see?**
  - NASA says, “Hubble can see the equivalent of “toddler galaxies” and Webb Telescope will be able to see “baby galaxies”.”
  - Webb's near- and mid-infrared instruments will help study the first formed galaxies, exoplanets and birth of stars.

**Insights JWT can offer about past**

- It is widely expected to unveil many secrets of the universe, particularly those related to the formation of stars and galaxies in the early period the first few hundred million years after the Big Bang.
- Powerful space telescopes, like JWST or the Hubble Telescope, are often called time-machines because of their ability to view very faraway objects.
- The light coming from those objects, stars or galaxies, which is captured by these telescopes, began its journey millions of years earlier.
- Essentially, what these telescopes see are images of these stars or galaxies as they were millions of years ago. The more distant the planet or star, the farther back in time are the telescopes able to see.
- JWST is much more powerful and has the ability to look in the infrared spectrum, which will allow it to peer through much deeper into the universe, and see through obstructions such as gas clouds.
- As electromagnetic waves travel for long distances, they lose energy, resulting in an increase in their wavelength.

- An ultraviolet wave, for example, can slowly move into the visible light spectrum and the infrared spectrum, and further weaken to microwaves or radio waves, as it loses energy.

- Hubble was designed to look mainly into the ultraviolet and visible regions of the electromagnetic spectrum. **JWST is primarily an infrared telescope**, the first of its kind.

- It can also **analyze the atmospheres of exoplanets** that pass in front of their stars.

- It will look at a large number of things in the universe including icy moons, distant exoplanets and galaxy clusters.
How James Webb will see back in time

Light from the Sun takes eight minutes to reach us, so we see the star as it was eight minutes ago.

If the Sun disappeared it would take us eight minutes to notice.

Light from a distant star may take years to reach us across the expanse of space, so we see it as it was years ago.

Approx 4 years

Closest star outside our Solar System (Alpha Centauri)

Light from the first stars began its journey billions of years ago so Webb will see those stars as they were billions of years ago.

Source: Nasa
Conclusion

JWST will study every phase in the history of our Universe, ranging from the first luminous glows after the Big Bang, to the formation of solar systems capable of supporting life on planets like Earth, to the evolution of our own Solar System, etc. Scientists hope this set-up can detect the light from the very first population of stars in the Universe to switch on more than 13.5 billion years ago.

What is Genome Sequencing? Discuss the various efforts by India in this regard? How far have they been successful? (250 words)

Difficult level: Moderate
Reference: Down to Earth
Why this question:
Gene sequencing has been in News as Pandemic has still not subsided.
Key demand of the question:
The question is straightforward; one must explain the concept of what is genome sequencing and Government measures in this regard.
Directive:
Discuss – This is an all-encompassing directive – you must debate on paper by going through the details of the issues concerned by examining each one of them. You must give reasons for both for and against arguments.
Structure of the answer:
Introduction:
In brief explain the concept of Gene Sequencing
Body:
If possible, try to draw diagram/flowchart to make your explanation clear.
Enumerate the various efforts taken by the Government of India in this regard and their impact.
Also, explain the challenges involved.
Conclusion:
Conclude with significance of such a project.

Introduction

Genome Sequencing refers to the method through which the order of DNA nucleotides, or bases, in a genome, the order of As, Cs, Gs, and Ts that make up an organism’s DNA are figured. The human genome is made up of over 3 billion of these genetic letters.

Body

About Genome sequencing

- A Genome is the complete genetic material of an organism. It is like an instruction manual which contains information about the make-up of the organism.
- While human genomes are made of DNA (Deoxyribonucleic acid), a virus genome can be made of either DNA or RNA (Ribonucleic acid).
- DNA and RNA provide genetic instructions for growth and functioning of organisms.
- Coronavirus is made of RNA. Genome sequencing is a technique that reads and interprets genetic information found within DNA or RNA.

Various initiatives by India
Genome India Project

- Taking inspiration from the Human Genome Project, this year, the Department of Biotechnology (DBT) initiated the ambitious “Genome India Project” (GIP) on 3rd January 2020.

- The GIP aims to collect 10,000 genetic samples from citizens across India, to build a reference genome.

- This project is led by the Centre for Brain Research at Bengaluru-based Indian Institute of Science, which acts as the central coordinator between a collaboration of 20 leading institutions, each collecting samples and conducting its own research.

- Institutes involved include the Indian Institute of Science (IISc) in Bengaluru as well as several Indian Institutes of Technology (IITs).

- For conducting the project, investigators in hospitals will lead the data collection through a simple blood test from participants and the information will be added to biobanks.

Indigen Project

- The IndiGen initiative was undertaken by CSIR in April 2019, which was implemented by the CSIR-Institute of Genomics and Integrative Biology (IGIB), Delhi and CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad.

- The objective is to enable genetic epidemiology and develop public health technologies applications using population genome data.

- This has enabled benchmarking the scalability of genome sequencing and computational analysis at population scale in a defined timeline.

- The ability to decode the genetic blueprint of humans through whole genome sequencing will be a major driver for biomedical science.

- IndiGen programme aims to undertake whole genome sequencing of thousands of individuals representing diverse ethnic groups from India.

INSACOG

- It is a multi-laboratory, multi-agency, Pan-India network to monitor genomic variations in the SARS-CoV-2 by a sentinel sequencing effort which is facilitated by the National Centre for Disease Control (NCDC), Delhi involving the Central Surveillance Unit (CSU) under Integrated Disease Surveillance Programme (IDSP).

- Selected private laboratories will join the Indian SARS CoV-2 Genomic Consortia (Insacog), a network of 28 government laboratories established for genomic surveillance in the country.

Evaluation of Genome Sequencing projects

- Genome sequencing helps researchers understand the arrangement of the make up of DNA or RNA. Sequencing the genome will help us understand where the certain virus for instance of SARS-CoV-2 came from and how it spread.

- Participants of genome-sample collections represent diversity of the country’s population. It will help in following ways:
• The first obvious use would be in **personalised medicine**, anticipating diseases and modulating treatment according to the genome of patients. Several diseases develop through the interplay of the environment with multiple genes, which differ across populations.

• Human genome sequencing is important to **establish a link between diseases and the unique genetic make-up of each individual**. For instance, cardiovascular disease generally leads to heart attacks in South Asians. If such propensities can be mapped to variations across genomes, it is believed public health interventions can be targeted better.

• While genes may render some insensitive to certain drugs, genome sequencing has shown that cancer too can be understood from the viewpoint of genetics, rather than being seen as a **disease of certain organs**.

• Another advantage of genome sequencing is that **information regarding drug efficacy or adverse effects of drug use** can be obtained. Drugs developed in the Western world and sold in India are pricey and may not be effective on the Indian gene. Mapping of India’s genetic landscape is critical for next generation medicine.

• It will enhance India’s scientific capabilities. Next step would be genome sequencing of crops that would help in better understanding of the genetic basis of susceptibility of crops to blights, rusts and pests. It may become possible to deter them genetically, and reduce dependence on chemicals.

• Global science would also benefit from genome sequencing, which would provide data useful for the mapping of the spread and migration of a range of life forms in the old World and thus would help in better understanding of human evolution.

**Conclusion**

WHO asserted that more the virus spreads, higher are chances of mutations and new strains to come up, so it is important to vaccinate a critical mass of people to break the chain of transmission at soon as possible and till then it is essential to follow preventive measures like social distancing, hand hygiene, wearing masks and taking the vaccine to avoid infections.

Highlight some of the future planned missions of ISRO, along with its usefulness, that will help harness space technology for national development. (250 words)

**Reference:** Indian Express

**Why this question**

The continued success of ISRO in the field of space technology, as demonstrated by yet another success discussed in the article makes ISRO an important organization for mains. Recently it has got a new chief.

**Key demand of the question**

The question expects us to bring out the future planned mission of ISRO and how will it help in national development.

**Structure of the answer**

**Introduction** – explain about ISRO as an organization.

Indian Space Research Organization (ISRO) was established in 1969. Since its beginning, ISRO has created a niche for itself in the space technology world through continuous low-cost innovations.
Body – Discuss the future missions of ISRO e.g. manned space flight, Chandranyan 3, Aditya L1, Shukrayaan, etc. and their usefulness for national development. Also, list down some of the challenges that ISRO might face.

Conclusion – Explain what ISRO’s success means for India.

Introduction

India began investing in Space science and technologies in the 1960s. Indian Space Research Organisation (ISRO), has historically viewed space technology applications primarily for societal development and not for addressing strategic or security objectives. India’s space programme has grown exponentially since its modest beginnings five decades ago and has finally earned its right to be considered an established space player. Today, the value of the global space industry is estimated to be $350 billion and is likely to exceed $550 billion by 2025.

Body

Future planned missions of ISRO

- **Gaganyaan project**: It is a crewed orbital spacecraft which is expected to carry three people into the space for seven days. It is expected to be complete before 2022. Recently, Human Space Flight Centre (HSFC) was inaugurated to coordinate Indian Human Spaceflight Programme (HSP) and will be responsible for the implementation of Gaganyaan Project.

- **Aditya-L1**: It will be India’s first solar observatory to be launched around 2022 which will be placed at the first Lagrangian point (L1) between the Sun and Earth, where the dynamic gravitational attraction between these two bodies roughly cancel out. It will observe the Sun’s surface and atmosphere with its seven instruments.

- **Shukrayaan**: It is a Venus orbiter mission to be launched in 2025 with the objective of studying of Venus’ surface and subsurface, its atmospheric chemistry and solar wind interactions with the planet.
  - The atmosphere of Venus contains a gas that on Earth can be attributed to living organisms. With this new signs of potential life beyond Earth, many missions to Venus have been proposed.
  - In September 2020, scientists have detected phosphine molecules on Venus, which could be a biosignature of microbial life.
  - Scientists also use Venus as a reference to understand how Earth-sized planets around other stars evolve and what conditions might exist there.

- **X-ray Polarimetry Satellite (XPoSat)**: It will be the country’s second space telescope, will be smaller and specialized. It will study the polarization of X-rays emitted by cosmic objects from Earth orbit.

- **Indian Data Relay Satellite System**: India plans for its own space-to-space tracking and communication of its space assets this year by putting up a new satellite series called IDRSS.
  - A set of 2 IDRSS satellites will be placed in geostationary orbit, enabling satellite to satellite communication and transfer of data.
  - It will track, send and receive real-time information from other Indian satellites, in particular those in low-earth orbits (LEO) which have limited coverage of earth.
It will also be useful in monitoring launches and benefitting crew members of the Gaganyaan mission ensuring mission control throughout their travel.

- **Chandrayaan-3 in 2022** which will include a rover and a lander to Moon.

**Obstacles faced by ISRO in space activities**

- **Training of astronauts**: India lacks training facilities for astronauts, though ISRO has demanded for indigenous training centers for its astronauts since early 2000s, no action have been taken yet.

- **Large investments** needed in projects and possibility of failure.

- **Biosciences**: While ISRO has perfected the engineering aspects of the mission, bioscience is a new field for ISRO that requires greater technological knowhow and collaboration and support from other organizations.

- **Upgrading GSLV Mk III**: Gaganyaan needs a large rocket that can lift a heavy capsule. Geosynchronous Satellite Launch Vehicle (GSLV) Mark III has been designed to inject large satellites into orbit, the launcher will now have to be human rated.

- **Precision in technology**: The reliability of a system has to be as high as to allow a failure rate of only one in 500 launches.

**Way forward**

- **Creating a separate Space Commerce body** that is independent of ISRO, for space-related activities or a dedicated road map within ISRO for commercial space in India.

- **Promoting startups** as they have potential of leapfrogging product/service offerings out of India and are scalable globally.

- **ISRO providing mentorship** allowing private sector to leverage technical expertise built by ISRO in an appropriate manner.

- **Enactment of space legislations**: To define regulatory, legal and procedural regimes with transparent timelines for pursuing space activities by private space industry.

- **Draft Space Activities Bill, 2017** was proposed to promote and regulate space activities of India. It talked about participation of private sector agencies in space activities in India under guidance and authorization of Department of Space.

**What is Metaverse? Discuss its potential applications as well as implications on the socio-economic aspects of the country.** (150 words, 10 marks)

**Introduction**

The term “metaverse” is used to **describe the vision whereby the internet will evolve into a virtual world**. The idea was first conceptualised in 1992 by the American novelist Neal Stephenson in his science fiction classic, Snow Crash. It foresees the **internet as a 3D virtual living space, where individuals dip in and out, interacting with one another in real time**.

The metaverse is a form of mixed reality that is fast becoming commonplace in everyday tech products. The combination of augmented and virtual reality will not only introduce digital elements in the real world, but it will also merge Internet with the virtual world.
Body

**Potential of Metaverse**

- Metaverse will incorporate current Meta products, like WhatsApp and Messenger, but also offer plenty of new tools like virtual homes, offices, and ecommerce opportunities for businesses and content creators.
- In Meta’s metaverse imagining, users will have complete creative control over their virtual worlds, designing everything from waterfront homes to space stations where you can work collaboratively, chat with friends, or study.
- Using VR, AR, and our current tech tools, the metaverse will combine both the physical and digital worlds.
- Facebook CEO Mark Zuckerberg believes augmented reality glasses will eventually be as widespread as smartphones. If that is the case, this will be a very big market.
- Huge scope in the development of software applications to support the meta-verse ecosystem.
- Heightened sales of physical goods and services will be linked to the virtual ecosystem in the future.
- Immersive Learning is a training methodology that uses Virtual Reality (VR) to simulate real-world scenarios and train students in a safe and engaging immersive training environment.
- Decentralized commerce (dCommerce) in-world transactions to happen peer-to-peer.
- **Non-Fungible Tokens (NFTs)** – the claim of ownership for a unique, non-interchangeable digital asset that is stored on a blockchain – may be widely adopted.

**Challenges posed by Metaverse:**

- The metaverse requires infrastructure that currently does not exist, and the current form of Internet is limited in its design to hold the digital space. The space will need a broader and more complex set of standards and protocols than traditional Internet. This means large technology companies like Amazon, Google, and Facebook will need to prepare for cross integrating their systems.
- Unlike the internet, which was built using patient capital, the metaverse will most likely be created by big tech companies, giving rise to concerns of walled gardens and cartelization.
- That said, it is clear that if the metaverse is to become as ubiquitous as the internet, it needs to remain open so that everyone can participate in it.
- The interoperable metaverse could also raise questions of data protection since industry-wide consensus on data security and persistence will be harder to establish.
- One of the key features of the metaverse will be its ability to replicate the physical world within its virtual environment.
  - The creation of these mirror-worlds will call for mega-scans of our physical surroundings—enormous centimetre-resolution images of the physical world that
we can render within the metaverse to faithfully recreate our physical environs in a virtual space.

- The metaverse will need altogether new rules for censorship, control of communications, regulatory enforcement, tax reporting, the prevention of online radicalisation, and many more challenges that we’re still struggling with today.

- It’s hard not to then start thinking about how these new technologies will shape our society, politics and culture, and how we might fit into that future.

- This idea is called “technological determinism”: the sense that advances in technology shape our social relations, power relations, and culture, with us as mere passengers. It leaves out the fact that in a democratic society we have a say in how all of this plays out.

- Another element of the metaverse that is still being worked out is its payment rails. While cryptocurrencies are widely touted as the ideal payment system of the metaverse, it is unlikely that they will be able to operate at the velocity at which transactions are likely to occur in these virtual environments.

**Way forward for India:**

- To achieve this, we will need to agree on a set of open standards that govern its essential aspects, ensuring interoperability across environments.

- We may ultimately need to pass regulation to ensure that other aspects of the metaverse—the devices we use to interface with it, the payment systems that drive its economy and the portals that connect the virtual world to the physical—comply with open protocols framed to ensure that we are not locked into any single device or service provider.

- India needs to put in place regulations that encourage the development of these new virtual environments while ensuring that they can still function in an open, interoperable manner.

- If this is the next evolution of internet technology, we should ensure that the many features it is likely to offer are deployed to our advantage.

- India’s digital payments platforms, on the other hand, have demonstrated that they can operate at population scale—processing 10 billion transactions a month without breaking a sweat.

**Conclusion**

A new iteration of the internet is being worked on and this will have massive implications for society. Marketing, communications, and branding professionals will face new challenges but also new opportunities. This new era of the metaverse will unleash amazing creativity and open up new frontiers and horizons for brands and businesses.

India was a relatively late adopter of the internet, and, as a result, was unable to take advantage of its many features until much later. We have an extraordinary opportunity now to actively participate in the development of the metaverse. We would do well to dive right in.
India Semiconductor Mission is a welcome acknowledgment of the strategic significance of integrated circuits to a modern economy. Discuss

(150 words, 10 marks)

Introduction

The Union Cabinet’s decision to set aside ₹76,000 crore for supporting the development of a ‘semiconductors and display manufacturing ecosystem’ is a belated but welcome acknowledgment of the strategic significance of integrated circuits, or chips, to a modern economy.

The Cabinet decision to simultaneously establish an India Semiconductor Mission helmed by ‘global industry experts’ to drive long-term strategies for the sustainable development of the chip and display industry is therefore a step in the right direction.

Body

Various applications of Semiconductors and reasons for their shortage

- Semiconductors and displays are the foundation of modern electronics driving the next phase of digital transformation under Industry 4.0. Semiconductors and display manufacturing is very complex and technology-intensive sector involving huge capital investments, high risk, long gestation and payback periods, and rapid changes in technology, which require significant and sustained investments.

- The program will give an impetus to semiconductor and display manufacturing by facilitating capital support and technological collaborations.

- The basic building blocks that serve as the heart and brain of all modern electronics and information and communications technology products, the ubiquitous chips are now an integral part of contemporary automobiles, household gadgets such as refrigerators, and essential medical devices such as ECG machines.

- The COVID-19 pandemic has dramatically thrown into sharp relief the vulnerability that a range of manufacturing industries and, by extension, national economies are exposed to in the face of disruptions in the supply of these vital semiconductors.

- The pandemic-driven push to take sizeable parts of daily economic and essential activity online, or at least digitally enable them, has also highlighted the centrality of the chip-powered computers and smartphones in people’s lives.

- With the bulk of semiconductor manufacturing and supply capability concentrated in a handful of countries including Taiwan, South Korea, U.S., Japan and, more recently, China, governments worldwide have realised that it is in the national interest to treat chip manufacturing as a strategic imperative.

Salient features of India Semiconductor Mission

- Semiconductor Fabs and Display Fabs:
  - It would provide fiscal support of up to 50% of the project cost for setting up semiconductor and display fabrication units.
  - The Union government will work with the States to set up high-tech clusters with the required infrastructure such as land and semiconductor-grade water.
• **Semi-conductor Laboratory (SCL):**
  
  o MeitY will take requisite steps for modernization and commercialization of Semi-conductor Laboratory (SCL).
  
  o MeitY will explore the possibility for the Joint Venture of SCL with a commercial fab partner to modernise the brownfield fab facility.

• **Compound Semiconductors:**
  
  o It will support fiscal support of 30% of capital expenditure to approved units.
  
  o At Least 15 such units of Compound Semiconductors and Semiconductor Packaging are expected to be established with Government support under this scheme.

• **Semiconductor Design Companies:**
  
  o The Design Linked Incentive (DLI) Scheme shall extend product design linked incentive of up to 50% of eligible expenditure and product deployment linked incentive of 6% – 4% on net sales for five years.
  
  o Support will be provided to 100 domestic companies of semiconductor design for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores and semiconductor linked design.

• **India Semiconductor Mission:**
  
  o In order to drive the long-term strategies for developing a sustainable semiconductors and display ecosystem, a specialised and independent India Semiconductor Mission (ISM) will be set up.
  
  o ISM will be led by global experts in the semiconductor and display industry. It will act as the nodal agency for efficient and smooth implementation of the schemes on Semiconductors and Display ecosystem.

• **Production Linked Incentives:**
  
  o Incentive support to the tune of Rs.55,392 crore (7.5 billion USD) have been approved under PLI for Largest Scale Electronics Manufacturing, PLI for IT Hardware, SPECS Scheme and Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme.
  
  o In addition, PLI incentives to the quantum of Rs.98,000 crore (USD 13 billion) are approved for allied sectors comprising ACC battery, auto components, telecom & networking products, solar PV modules and white goods.

Limitations of the above and measures to overcome them.

• For one, the level of fiscal support currently envisioned is minuscule when one considers the scale of investments typically required to set up manufacturing capacities in the various sub sectors of the semiconductor industry.

• A semiconductor fabrication facility, or fab, can cost multiples of a billion dollars to set up even on a relatively small scale and lagging by a generation or two behind the latest in technology.
Even granting that India’s Production Linked Incentive scheme intends to give only 50% of the cost of setting up at least two greenfield semiconductor fabs by way of fiscal support, not much of the current scheme outlay of approximately $10 billion is likely to be left to support other elements including display fabs, packaging and testing facilities, and chip design centres.

Chip fabs are also very thirsty units requiring millions of litres of clean water and extremely stable power supply.

India has a decent chip design talent but it never built up chip fab capacity. The ISRO and the DRDO have their respective fab foundries but they are primarily for their own requirements and also not as sophisticated as the latest in the world.

It may be best if the new mission focuses fiscal support, for now, on other parts of the chip-making chain including design, where surely India already has considerable talent and experience.

Way Forward:

Given the long gestation periods and rapid technology changes, India must out-strategize on design and functionality as the end product will be out only after three-four years from the moment work begins, by which point the prevailing chip shortage would have been resolved, while technology would have advanced further.

India needs to push for a Quad Supply Chain Resilience Fund to immunise the supply chain from geopolitical and geographic risks.

India and Taiwan have started negotiations for a free-trade agreement and setting up a semiconductor manufacturing hub in an Indian city, signalling their resolve to further expand the two-way economic engagement.

Conclusion:
The program will usher in a new era in electronics manufacturing by providing a globally competitive incentive package to companies in semiconductors and display manufacturing as well as design. The program will promote higher domestic value addition in electronics manufacturing and will contribute significantly to achieving a USD 1 Trillion digital economy and a USD 5 Trillion GDP by 2025. This shall pave the way for India’s technological leadership in these areas of strategic importance and economic self-reliance.

The COVID-19 pandemic has disrupted the functioning of SHGs—the backbone of the Deendayal Antyodaya Yojana-National Rural Livelihood Mission (DAY-NRLM) and addressing this will help the income-generating activities of SHGs. (250 words, 15 marks)

Introduction

Self-help groups are informal groups of people who come together to address their common problems. These self-help groups consist of around 8-10 women who pool their savings and use the corpus to give credit to members to earn a living. They are promoted under the central Deendayal Antyodaya Yojana- National Rural Livelihood Mission (DAY-NRLM) launched in 2011 to empower women by providing them with easy access to credit. But in the last one year, they have gone
beyond this role to do community work with funding from governments and non-governmental organisations (NGOs), including tasks normally performed by health activists.

Recently, Prime Minister transferred ₹1,000 crore to bank accounts of self-help groups to benefit around 16 lakh women under the Deendayal Antyodaya Yojana-National Rural Livelihood Mission (DAY-NRLM).

Body

Work done by SHG’s during pandemic

- Nearly 76 million women in rural India had taken up self-help initiatives that proved instrumental in managing the food insecurity and healthcare challenges posed by the pandemic, an October 2020 report by the Initiative for What Works to Advance Women and Girls in the Economy (IWWAGE) said.

- Since March 2020, and as per July 21 data from the DAY-NRLM dashboard, these groups have manufactured nearly 170 million masks, 500,000 pieces of protective equipment and 500,000 litres of sanitiser.

- Through community kitchens, they also served more than half a million cooked meals to people from vulnerable communities.

- To help deal with this crisis, self-help groups helped rural communities by distributing food and ration supplies and creating awareness.

Impact of COVID on SHGs

- With perennially scarce resources and a lack of funding, many NGOs are no longer able to provide capacity-building support to SHGs. As a result, the less-established SHGs are disintegrating.

- The NPAs of the SHG-BLP surged from ₹.423 crore in 2007-08 to ₹4,524 crore in 2018-19. This situation of bad loans will be further accentuated and dent the sustainability of SHG-BLP on account of Covid-19 pandemic if the SHGs do not convert the problems into opportunities.

- Despite increased activity, SHGs are having a hard time dealing with loss of income and rising debts as members deal with the economic impact of the pandemic, studies have found.

- Livelihood opportunities have been severely impacted due to the economic shock of Covid, especially its impact on non-farm livelihoods, in which a large section of women members of SHGs are involved.

- Self-help group members saw a higher borrowing rate (59%) against 42% women on average, a study of 15,000 women and 2,300 men from low-income households across 10 states conducted between October and November 2020 found. But members have been struggling to return their loans taken from SHGs.

- COVID has thrown many challenges to the members of SHGs with regard to conducting physical meeting, mobilising savings (physical currency notes) of the group, rotating the money for internal lending among the members, depositing the physical cash towards repayment of loans, and maintaining hard copy of records.
• Several rural women who were members of SHGs from different districts, claimed that their financial condition was affected by the pandemic, pushing them further into debt.

Way forward

• Given the adverse impact on the economy, there is an urgent need to think about new funding dedicated to crisis amelioration (perhaps through cash transfers), as well as an extended moratorium period or flexible repayment schedules for existing loans.

• Government or development sector stakeholders like the National Bank for Agriculture and Rural Development could help sustain and strengthen SHGs by federating them and helping them access the funding they need to increase their already significant impact on rural livelihoods.

• Federating would imply clustering the self-help groups together, which would give them a larger pool of savings to leverage, more negotiating power, and the benefits of economies of scale.

• Federating SHGs would also introduce greater transparency and professionalism to the groups, while requiring the simplification of their legal structures, allowing members to manage them without the need of hiring costly professionals.

• By embracing digital tech like e-banking, e-commerce and social media, SHGs can tide over the operational problems thrown up by the pandemic.

• Leading from the front, self-help groups have played a critical role in providing resilience for households during the pandemic and going forward, there is a heightened need for strengthening their links to institutions and creating a supportive ecosystem for them.

Conclusion

With the proper support, self-help groups can have an even greater impact, at a time when their women-centric, community-based approach is particularly needed. Government and development sector stakeholders should act now to strengthen this time-tested model: Women in India, and around the world, have never needed it more.

What is a cryptocurrency? Discuss the need for the formulation of a clear, constructive, and adaptive regulatory environment for cryptocurrencies in India. (250 Words )

Level: Moderate

Reference: The Hindu, Indian Express

Why this question:

Recently, a government introduced a bill in the parliament to regulate cryptocurrency in India.

Key demand of the question:

The question aims to analyze the concept of cryptocurrency and its regulation.

Directive:

Discuss – This is an all-encompassing directive – you have to debate on paper by going through the details of the issues concerned by examining each one of them. You have to give reasons for both for and against arguments.

Structure of the answer:

Introduction:

Begin with a brief on what is a cryptocurrency – “any information or code or number or token not being part of any official digital currency, generated through cryptographic means or otherwise,
providing a digital representation of value which is an exchange with or without consideration, with the promise or representation of having an inherent value in any business activity which may involve risk of loss or an expectation of profits or income, or functions as a store of value or a unit of account and includes its use in any financial transaction or investment, but not limited to, investment schemes.”

Body:
Highlight the issues that the use of cryptocurrencies creates for regulators. Also, mention the benefits that it provides. Then mention why it needs to be regulated. You should mention the findings of RBI, Garg Committee (2019) as well as the government on cryptocurrencies.

Conclusion:
Conclude with the way forward.

Introduction
Cryptocurrencies are digital currencies in which encryption techniques are used to regulate the generation of units of currency and verify the transfer of funds, operating independently of a central bank. Created by Satoshi Nakamoto in 2008, Bitcoin is the most popular cryptocurrency. It is a fully decentralised, peer-to-peer electronic cash system that didn’t need the purview of any third-party financial institution.

Body

Need for Cryptocurrencies:

- **Corruption Check:** As blocks run on a peer-to-peer network, it helps keep corruption in check by tracking the flow of funds and transactions.

- **Time Effective:** Cryptocurrencies can help save money and substantial time for the remitter and the receiver, as it is conducted entirely on the Internet, runs on a mechanism that involves very less transaction fees and is almost instantaneous.

- **Cost Effective:** Intermediaries such as banks, credit card and payment gateways draw almost 3% from the total global economic output of over $100 trillion, as fees for their services. Integrating blockchain into these sectors could result in hundreds of billions of dollars in savings.

Cryptocurrencies in India:

- In 2018, The RBI issued a circular preventing all banks from dealing in cryptocurrencies. This circular was declared unconstitutional by the Supreme Court in May 2020.

- Recently, the government has announced to introduce a bill; **Cryptocurrency and Regulation of Official Digital Currency Bill, 2021**, to create a sovereign digital currency and simultaneously ban all private cryptocurrencies.

- In India, the funds that have gone into the Indian blockchain start-ups account for less than 0.2% of the amount raised by the sector globally.

- The current approach towards cryptocurrencies makes it near-impossible for blockchain entrepreneurs and investors to acquire much economic benefit.

Need for regulation

- Regulation is definitely needed to prevent serious problems, to ensure that cryptocurrencies are not misused, and to protect unsuspecting investors from excessive market volatility and possible scams.
• However, regulation needs to be clear, transparent, coherent and animated by a vision of what it seeks to achieve.

• India has not been able to tick these boxes, and we’re in danger of missing out in the global race altogether.

Way forward

• Any new regulations made in this sector should prevent the misuse of these digital assets without hindering innovation and investments.

• Clarity on Crypto-currency definition: A legal and regulatory framework must first define crypto-currencies as securities or other financial instruments under the relevant national laws and identify the regulatory authority in charge.

• Strong KYC Norms: Instead of a complete prohibition on cryptocurrencies, the government shall rather regulate the trading of cryptocurrencies by including stringent KYC norms, reporting and taxability.

• Provisions have to be made to route the value extracted from these networks transparently into our financial system.

• Regulatory uncertainties over India’s position on cryptocurrency highlights the need for clear-headed policy-making.

Conclusion

India is currently on the cusp of the next phase of digital revolution and has the potential to channel its human capital, expertise and resources into this revolution, and emerge as one of the winners of this wave. All that is needed to do is to get the policymaking right. Blockchain and crypto assets will be an integral part of the Fourth Industrial Revolution, Indians shouldn’t be made to simply bypass it.

Inducting LCA Tejas Fighter craft will enhance the strength of the Indian Air force with its state of Arts Technology. Analyse (150 Words)

**Difficulty level:** Moderate

**Reference:** The Hindu

**Why this question**

India is the world’s largest arms importer and given our economic size and talent pool, this is a matter of grave concern for us. In this context, the induction of LCA Tejas has been seen as a significant step towards the indigenisation of defence technology.

**Directive word**

Analyse – When asked to analyse, you must examine methodically the structure or nature of the topic by separating it into component parts and presenting them in a summary

**Key demand of the question.**

The question wants us to trace the development of LCA Tejas and analyse whether its induction will give India a significant advantage.

**Structure of the answer**

**Introduction**– write a few introductory lines about LCA Tejas and the Indian defence imports. E.g. mention that India is the world’s largest defence importer etc.

**Body**

Highlight some of the features of LCA Tejas and its state of the art technology. Then, enumerate the significant advantages that LCA Tejas will bring to India’s defence capability vis-à-vis Pakistan and China.
Then list down some of the issues and constraints that still hamper India’s LCA programme and defence indigenization in general.

For further reference you can refer to The week, News18

Conclusion—
Based on your analysis, form a fair and balanced conclusion.

Introduction

The Light Combat Aircraft (LCA)-Tejas was conceptualised in the year 1984. Since the first flight of the LCA technology demonstrator in January 2001, the indigenous single engine 4.5 generation multi-role fighter jet christened as ‘Tejas’ by then Prime Minister Atal Bihari Vajpayee in May 2003, has come a long way both in terms of the maturity of the platform as well as the overall aircraft development programme despite repeated delays and cost overruns. In all, 123 LCA aircraft of various configurations are on order so far.

Body

Features of LCA Tejas

- The lightest, smallest and tailless multi-role supersonic fighter aircraft in its class.
- Designed to carry a range of air-to-air, air-to-surface, precision-guided, weapons.
- Air to air refuelling capability.
- Maximum payload capacity of 4000 kg.
- It can attend the maximum speed of Mach 1.8.
- The range of the aircraft is 3,000km.
- Aerial refuelling probe compatible with Russian & US tankers
- Drop tanks for ferry flight/extended range/loitering time

LCA Tejas: Enhancing the strength of Indian Airforce

- The Cabinet Committee on Security has recently cleared a deal worth Rs. 48,000 crore for the acquisition of 83 Tejas Light Combat Aircraft for the Indian Air Force.
  - 83 Tejas includes 73 LCA Tejas Mk-1A fighter aircraft and 10 LCA Tejas Mk-1 trainer aircraft.
- MK-1A variant is an improved version of MK-1 with an electronic warfare system, advanced electronically scanned array (AESA) radar, beyond visual range (BVR) missiles and a network warfare system comprising software defined radio (SDR).
- In a step towards further strengthening the capabilities of the indigenous LCA Tejas fighter aircraft, the Indian Air Force has placed orders for HAMMER missiles from France which would allow it to take out any hardened bunkers or ground targets at stand-off ranges of more than 70 kilometres.
- The Indian Air Force is strongly supporting the indigenous LCA Tejas fighter aircraft programme by adding more and more capabilities of the aircraft.
The IAF has already operationalised two of its squadrons in the initial operational clearance and final operational clearance versions while a contract has been signed for the 83 Mark1As set to be delivered a couple of years from now.

The Indian plane is already considered to be far more capable than the Pakistani and Chinese joint venture JF-17 fighter jet and with additions like the HAMMER, the Indian plane would be in a much higher category than them.

**Conclusion**

The Light Combat Aircraft Tejas is an indigenous supersonic aircraft used by the Indian military. The induction of this state of art combat aircraft not only increases the capacity of Air force, it will also reduce our dependency on foreign aircrafts. It will spur defence innovation and start-ups, nurturing an ecosystem that will make India an exporter of defence products in the near future.
Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

Cryptocurrencies are said to empower people on one hand but at the same time create regulatory hurdles on the other. In light of the statement discuss the pros and cons of banning cryptocurrencies. (250 Words)

Difficulty level: Moderate
Reference: The Hindu
Why the question:
The government has recently proposed that cryptocurrencies be banned but crypto assets be legalised and strongly regulated.
Key Demand of the question:
Briefly describe the advantages and disadvantages of banning cryptocurrencies.
Directive word:
Discuss – This is an all-encompassing directive – you must debate on paper by going through the details of the issues concerned by examining each one of them. You must give reasons for both for and against arguments.
Structure of the answer:
Introduction:
Briefly describe what are Cryptocurrencies and the current debate about their use.
Body:
Give a description of how cryptocurrencies can be a tool for empowerment e.g. it is a great opportunity for poorly banked countries. Then, go on to briefly describe how it creates regulatory hurdles such as misuse of cryptocurrency is hard to detect.
Then next, enumerate some pros of banning (e.g. it will prevent money laundering using crypto) and cons (e.g. it will give a tech-unfriendly image for India)
Conclusion:
Conclude by giving a balanced view about the use of cryptocurrency.
Introduction
A cryptocurrency is a digital asset designed to work as a medium of exchange wherein individual coin ownership records are stored in a ledger existing in a form of a computerized database. It uses strong cryptography to secure transaction records, to control the creation of additional coins, and to verify the transfer of coin ownership. It typically does not exist in physical form (like paper money) and is typically not issued by a central authority.

Body
Pros of banning cryptocurrencies
• **Sovereign guarantee:** Cryptocurrencies pose risks to consumers. They do not have any sovereign guarantee and hence are not legal tender.

• **Market volatility:** Their speculative nature also makes them highly volatile. For instance, the value of Bitcoin fell from USD 20,000 in December 2017 to USD 3,800 in November 2018.

• **Risk in security:** A user loses access to their cryptocurrency if they lose their private key (unlike traditional digital banking accounts, this password cannot be reset).

• **Malware threats:** In some cases, these private keys are stored by technical service providers (cryptocurrency exchanges or wallets), which are prone to malware or hacking.

• **Money laundering.**
Issues Associated with Banning Decentralised Cryptocurrencies

- **Blanket Ban:** The intended ban is the essence of the Cryptocurrency and Regulation of Official Digital Currency Bill, 2021. It seeks to prohibit all private cryptocurrencies in India.

- However, categorising the cryptocurrencies as public (government-backed) or private (owned by an individual) is inaccurate as the cryptocurrencies are decentralised but not private.

- Decentralised cryptocurrencies such as bitcoin aren’t or rather, can’t be controlled by any entity, private or public.

- **Brain-DRAIN:** Ban of cryptocurrencies is most likely to result in an exodus of both talent and business from India, similar to what happened after the RBI’s 2018 ban.

- Back then, blockchain experts moved to countries where crypto was regulated, such as Switzerland, Singapore, Estonia and the US. With a blanket ban, blockchain innovation, which has uses in governance, data economy and energy, will come to a halt in India.

- **Deprivation of Transformative Technology:** A ban will deprive India, its entrepreneurs and citizens of a transformative technology that is being rapidly adopted across the world, including by some of the largest enterprises such as Tesla and MasterCard.

- **An Unproductive Effort:** Banning as opposed to regulating will only create a parallel economy, encouraging illegitimate use, defeating the very purpose of the ban.

- A ban is infeasible as any person can purchase cryptocurrency over the internet.

- **Contradictory Policies:** Banning cryptocurrency is inconsistent with the Draft National Strategy on Blockchain, 2021 of the Ministry of Electronics and IT (MeitY), which hailed blockchain technology as transparent, secure and efficient technology that puts a layer of trust over the internet.

Way Forward

- **Regulation is the Solution:** Regulation is needed to prevent serious problems, to ensure that cryptocurrencies are not misused, and to protect unsuspecting investors from excessive market volatility and possible scams.

- The regulation needs to be clear, transparent, coherent and animated by a vision of what it seeks to achieve.

- **Clarity on Crypto-currency definition:** A legal and regulatory framework must first define crypto-currencies as securities or other financial instruments under the relevant national laws and identify the regulatory authority in charge.

- **Strong KYC Norms:** Instead of a complete prohibition on cryptocurrencies, the government shall rather regulate the trading of cryptocurrencies by including stringent KYC norms, reporting and taxability.

- **Ensuring Transparency:** Record keeping, inspections, independent audits, investor grievance redressal and dispute resolution may also be considered to address concerns around transparency, information availability and consumer protection.
• **Igniting the Entrepreneurial Wave:** Cryptocurrencies and Blockchain technology can reignite the entrepreneurial wave in India’s start-up ecosystem and create job opportunities across different levels, from blockchain developers to designers, project managers, business analysts, promoters and marketers.

**Conclusion**

India is currently on the cusp of the next phase of digital revolution and has the potential to channel its human capital, expertise and resources into this revolution, and emerge as one of the winners of this wave. All that is needed to do is to get the policymaking right. Blockchain and crypto assets will be an integral part of the Fourth Industrial Revolution, Indians shouldn’t be made to simply bypass it.

Account for the increasing concern regarding antimicrobial resistance (AMR)? What initiatives have been taken by India and the International organizations to combat it? (250 words)

**Difficulty level:** Moderate

**Reference:** Indian Express

**Why the question:**
The Global Research on Antimicrobial Resistance (GRAM) report used statistical modelling to estimate deaths linked to 23 pathogens and 88 pathogen-drug combinations.

**Key Demand of the question:**
To write about concerns surrounding AMR and initiatives taken to tackle it.

**Directive word:**
Discuss – This is an all-encompassing directive – you must debate on paper by going through the details of the issues concerned by examining each one of them. You must give reasons for both for and against arguments.

**Structure of the answer:**

**Introduction:**
Define AMR and its causes.

**Body:**
First, write about why there is global cause of concern – Superbug, Multidrug resistance to bacterium and viruses, Increased cost of treatment, prolonged hospitalisation, increased mortality and less effective inoculation. Give reasons behind it.

Next, write about the various initiatives to tackle AMR – Global Action Plan on AMR, World Anti-microbial awareness week, Delhi Declaration on AMR, National Action Plan on Antimicrobial Resistance etc.

Also, briefly examine their success.

**Conclusion:**
Conclude by writing a way forward.

**Introduction**
The WHO defines **antimicrobial resistance (AMR)** as a condition wherein microbes survive when exposed to the drug which would have normally caused them to die. It is the resistance acquired by any microorganism like bacteria, viruses, fungi, parasite, etc. against antimicrobial drugs (such as antibiotics, antifungals, antivirals, antimalarial, and anthelmintic) that are used to treat infections and is regarded as a major threat to public health across the globe.

Microorganisms that develop antimicrobial resistance are sometimes referred to as “superbugs”. As a result, standard treatments become ineffective, infections persist and may spread to others.

**Body**
A growing list of infections – such as pneumonia, tuberculosis, blood poisoning, gonorrhoea, and foodborne diseases – are becoming tougher, and at times impossible, to treat as antibiotics become less productive, emergence and spread of resistance is made worse because of procurement of antibiotics for animal and human consumption without a doctor’s supervision or a prescription etc.

**AMR: a global threat**

- AMR represents an existential threat to modern medicine.
- All these effects will be felt globally, but the scenario in the low-and middle-income countries (LMICs) of Asia and Africa is even more serious.
- 7 million people worldwide die annually because they cannot access drugs for infections that are treatable.
- Without concerted action, Drug-resistant diseases could cause 10 million deaths each year by 2050, and trigger an economic slowdown to rival the global financial crisis of 2008 warned the UN Ad Hoc Interagency Coordinating Group on Antimicrobial Resistance in a report.
- It added that by 2030, antimicrobial resistance could force up to 24 million people into extreme poverty. In the worst-case scenario, the world will lose 3.8% of its annual GDP by 2050.
- Currently, at least 7,00,000 people die each year due to drug-resistant diseases, including 2,30,000 people who die from multidrug-resistant tuberculosis.
- It also noted that more and more common diseases, including respiratory tract infections, sexually transmitted infections and urinary tract infections, are becoming untreatable.
- Lifesaving medical procedures are becoming riskier, and food systems are getting increasingly precarious. A very significant part of out-of-pocket expenditure on health care is on medicines. The ineffective drugs and/or second line expensive antibiotics is pushing the treatment costs higher.
- The report noted that the world is already feeling the economic and health consequences as crucial medicines become ineffective.
- Without investment from countries in all income brackets, future generations will face the disastrous impacts of uncontrolled antimicrobial resistance.

**AMR in India:**

- Burden of infectious disease (Bacterial infections) is high and healthcare spending is low.
- The National Health Policy 2017 highlights the problem of antimicrobial resistance and calls for effective action to address it.
- The Ministry of Health & Family Welfare (MoHFW) identified AMR as one of the top 10 priorities for the ministry’s collaborative work with WHO.
- In 2012, India’s medical societies adopted the Chennai Declaration, a set of national recommendations to promote antibiotic stewardship.
India’s Red Line campaign demands that prescription-only antibiotics be marked with a red line, to discourage the over-the-counter sale of antibiotics.

- India has instituted surveillance of the emergence of drug resistance in disease causing microbes in programmes on Tuberculosis, Vector Borne diseases, AIDS, etc.
- Since March 2014 a separate Schedule H-1 has been incorporated in Drug and Cosmetic rules to regulate the sale of antimicrobials in the country.
- The Food Safety and Standards Authority of India (FSSAI) banned the use of antibiotics and several pharmacologically active substances in fisheries.
- The government has also capped the maximum levels of drugs that can be used for growth promotion in meat and meat products.

International Efforts

- A multi-sectoral $1 billion AMR Action Fund was launched in 2020 to support the development of new antibiotics.
- Peru’s efforts on patient education to reduce unnecessary antibiotic prescriptions.
- Australian regulatory reforms to influence prescriber behaviour.
- Denmark’s reforms to prevent the use of antibiotics in livestock have not only led to a significant reduction in the prevalence of resistant microbes in animals, but also improved the efficiency of farming.
- India proposed laws to curb the amount of active antibiotics released in pharmaceutical waste.

Way forward

- In addition to developing new antimicrobials, infection-control measures can reduce antibiotic use.
- It is critical to ensure that all those who need an antimicrobial have access to it.
- To track the spread of resistance in microbes, surveillance measures to identify these organisms need to encompass livestock, wastewater and farm run-offs.
- We need sustained investments and global coordination to detect and combat new resistant strains on an ongoing basis.
- International alignment and coordination are paramount in both policymaking and its implementation.
- Solutions in clinical medicine must be integrated with improved surveillance of AMR in agriculture, animal health and the environment.

Conclusion
Anti-Microbial Resistance is not a country specific issue but a global concern that is jeopardizing global health security. Antimicrobial resistance is one of the major public health problems. Reducing the incidence of infection through effective infection prevention and control. As stated by WHO, making infection prevention and hand hygiene a national policy priority is need of the hour.

**Value addition**

**Reasons for the spread of AMR:**

- **Antibiotic consumption in humans**
  - Unnecessary and injudicious use of antibiotic fixed dose combinations could lead to emergence of bacterial strains resistant to multiple antibiotics.

- **Social factors**
  - Self-medication.
  - Access to antibiotics without prescription.
  - Lack of knowledge about when to use antibiotics.

- **Cultural Activities**
  - Mass bathing in rivers as part of religious mass gathering occasions.

- **Antibiotic Consumption in Food Animals**
  - Antibiotics which are critical to human health are commonly used for growth promotion in poultry.

- **Pharmaceutical Industry Pollution**
  - The wastewater effluents from the antibiotic manufacturing units contain a substantial amount of antibiotics, leading to contamination of rivers and lakes.

- **Environmental Sanitation**
  - Untreated disposal of sewage water bodies – leading to contamination of rivers with antibiotic residues and antibiotic-resistant organisms.

- **Infection Control Practices in Healthcare Settings**
  - A report on hand-washing practices of nurses and doctors found that only 31.8% of them washed hands after contact with patients.

‘Unemployment has been found to be more prevalent in the educated and less so in the poor, unskilled and semi-skilled people’. Clarifying the statement, bring out the causes for the sharp decline in the jobs in India as per the latest data. (250 Words)

**Reference:** BBC

**Introduction**

Unemployment has become a chronic problem of India and in the recent years the situation has only worsened. The Centre for Monitoring Indian Economy (CMIE) recently released the unemployment
status report of India for the month of December, 2021. According to the report, the unemployment rate in the country was 7.91% in December. It was 7% in November.

Body

Unemployment crisis in India

- With migrant labourers retreating to their native places, the impact seems to be more severe in urban areas where the unemployment rate is now reaching 10 per cent.
- With 73.5 lakh job losses in April, the number of employees (both salaried and non-salaried) fell from 39.81 crore in March to 39.08 crore in April for the third straight month.
- In April 2020, which was the first full month of the national lockdown last year, the unemployment rate had zoomed to 23.5%.
- Women tend to face a double challenge, with lower labour participation and a higher unemployment rate for females compared with males (for ages above 15).
- For the January-April 2021 period, urban female LPR was 7.2% compared with the urban male’s 64.8%, while urban female unemployment was 18.4% against the urban male unemployment rate of 6.6%, CMIE data showed.

Causes for the sharp decline in the jobs in India

- The labour force is the sum of the employed and those unemployed who are seeking employment.
- A shrinking of the labour force is most unusual in an economy with a growing population, and thus a growing working age cohort.
- **Low education and lack of skills** lead to loss of many job opportunities.
- **Discouraged-worker effect**: A section of those hitherto willing to work may have simply dropped out of an already challenged labour market.
- **Demonetization** has caused demoralisation among a section of the already unemployed who may have given up all hope of finding employment.
- About **90% of Indian Workforce is in the unorganized sector** which was majorly affected during Demonetization and GST introduction.
- **Declining Capital formation** which is not backed by Public and Private Investment.
- **Low female LFPR to the tunes of 24%** also adds to high unemployment rate.
- **Automation and IR4.0** is a looming threat to many jobs which have repeated work or sequential work.
- Socially disadvantaged groups do not get enough exposure in the job market like the general castes and Other Backward Classes.
- Labour laws in India are complex and relatively strict. Employment protection legislation is restrictive, compared with other emerging economies and OECD countries. Thus, corporates in India tend to rely more on temporary contract labour, stay small or substitute labour for capital to avoid strict labour laws.
Measures suggested

- **Increase public spending in education:**
  - At 3.8% of GDP, public spending on education in India is lower than countries like Brazil and Malaysia.
  - The focus of the government needs to shift to spending on enhancing the quality of education and vocational training.

- Similarly, allowing foreign investment in sectors like legal and accountancy services will create employment as more foreign firms will move to India.

- Infrastructure investment can also be utilised as an engine of job-creation.

- Investing in people through healthcare, quality education, jobs and skills helps build human capital, which is key to supporting economic growth, ending extreme poverty, and creating more inclusive societies.

- **Educated unemployment:**
  - Besides promoting technical education, the government needs to focus more on creation of jobs and demand for workers since industries are unable to create sufficient job opportunities for all the technically educated people.
  - Policies should ensure that the education systems prepare young people for the skill demands of employers through outreach programmes, training, apprenticeships, and access to job-search assistance measures.
  - More businesses should recognise the opportunity, and need, to invest in young people so that they can help in developing the qualities necessary for education and future employment.
  - **NGOs** should engage collectively in policy advocacy on youth. They should also partner with companies to develop skills and training programmes to tackle youth unemployment.
  - Singapore has launched certain programmes to establish partnerships between domestic and foreign universities to promote tertiary education. India could learn from such initiatives.
  - New age sectors like defence and aerospace, education and healthcare, and burgeoning green sectors like solar energy and wind, present another massive opportunity to identify ‘upcoming jobs’ and prepare talent accordingly. India’s ambition to create more than **one million new jobs in the green energy sector by 2022** is encouraging.

- **Educated unemployment:**
  - There should be cluster development to support job creation in micro, small and medium enterprises (MSMEs). Most of the unorganised sector employment is in MSMEs, which tend to be concentrated in specific geographic locations.
Private sector leaders should build capacity among unskilled and semi-skilled workers to ensure sustainability of renewable energy projects and provide opportunities to rural communities.

Government officials should create public training programmes to prepare the poor and less educated people especially semi-skilled and unskilled for employment in the clean-energy sector.

People need to be made self-employed by providing training in skills and latest technologies for agriculture and other avenues especially in rural areas.

Women in rural areas who are left behind by men due to migration need to look into other sources of livelihood other than agriculture like animal husbandry etc..

Conclusion

In 2020, although the economy was in a very poor state following the deleterious effects of demonetisation, the rural economy was faring reasonably well on the back of two good monsoons.

However, after a year of distress, and with some part of the workforce still not having returned to their work places, rural incomes are expected to be under pressure. Economists say they are already seeing signs of sluggishness in rural consumption.

Value-addition

Steps taken by government in recent times

- Dedicated Shram Suvidha Portal: That would allot Labor Identification Number (LIN) to units and allow them to file online compliance for 16 out of 44 labor laws.

- Random Inspection Scheme: To eliminate human discretion in selection of units for Inspection, and uploading of Inspection Reports within 72 hours of inspection mandatory.

- Universal Account Number: Enables 4.17 crore employees to have their Provident Fund account portable, hassle-free and universally accessible.

- Apprentice Protsahan Yojana: Government will support manufacturing units mainly and other establishments by reimbursing 50% of the stipend paid to apprentices during first two years of their training.

- Revamped Rashtriya Swasthya Bima Yojana: Introducing a Smart Card for the workers in the unorganized sector seeded with details of two more social security schemes.

- The National Career Service is being implemented as a mission mode project to provide various job-related services information on skills development courses, internships etc

Highlight some of the future planned missions of ISRO, along with its usefulness, that will help harness space technology for national development. (150 words)

Introduction

India began investing in Space science and technologies in the 1960s. Indian Space Research Organisation (ISRO), has historically viewed space technology applications primarily for societal development and not for addressing strategic or security objectives. India’s space programme has grown exponentially since its modest beginnings five decades ago and has finally earned its right to
be considered an established space player. Today, the value of the global space industry is estimated to be $350 billion and is likely to exceed $550 billion by 2025.

Body

Future planned missions of ISRO

- **Gaganyaan project**: It is a crewed orbital spacecraft which is expected to carry three people into the space for seven days. It is expected to be complete before 2022. Recently, Human Space Flight Centre (HSFC) was inaugurated to coordinate Indian Human Spaceflight Programme (HSP) and will be responsible for the implementation of Gaganyaan Project.

- **Aditya-L1**: It will be India’s first solar observatory to be launched around 2022 which will be placed at the first Lagrangian point (L1) between the Sun and Earth, where the dynamic gravitational attraction between these two bodies roughly cancel out. It will observe the Sun’s surface and atmosphere with its seven instruments.

- **Shukrayaan**: It is a Venus orbiter mission to be launched in 2025 with the objective of studying of Venus’ surface and subsurface, its atmospheric chemistry and solar wind interactions with the planet.
  - The atmosphere of Venus contains a gas that on Earth can be attributed to living organisms. With this new signs of potential life beyond Earth, many missions to Venus have been proposed.
  - In September 2020, scientists have detected phosphine molecules on Venus, which could be a biosignature of microbial life.
  - Scientists also use Venus as a reference to understand how Earth-sized planets around other stars evolve and what conditions might exist there.

- **X-ray Polarimetry Satellite (XPoSat)**: It will be the country’s second space telescope, will be smaller and specialized. It will study the polarization of X-rays emitted by cosmic objects from Earth orbit.

- **Indian Data Relay Satellite System**: India plans for its own space-to-space tracking and communication of its space assets this year by putting up a new satellite series called IDRSS.
  - A set of 2 IDRSS satellites will be placed in geostationary orbit, enabling satellite to satellite communication and transfer of data.
  - It will track, send and receive real-time information from other Indian satellites, in particular those in low-earth orbits (LEO) which have limited coverage of earth.
  - It will also be useful in monitoring launches and benefitting crew members of the Gaganyaan mission ensuring mission control throughout their travel.

- **Chandrayaan-3 in 2022** which will include a rover and a lander to Moon.

Obstacles faced by ISRO in space activities

- **Training of astronauts**: India lacks training facilities for astronauts, though ISRO has demanded for indigenous training centers for its astronauts since early 2000s, no action have been taken yet.
• **Large investments** needed in projects and possibility of failure.

• **Biosciences**: While ISRO has perfected the engineering aspects of the mission, bioscience is a new field for ISRO that requires greater technological knowhow and collaboration and support from other organizations.

• **Upgrading GSLV Mk III**: Gaganyaan needs a large rocket that can lift a heavy capsule. Geosynchronous Satellite Launch Vehicle (GSLV) Mark III has been designed to inject large satellites into orbit, the launcher will now have to be human rated.

• **Precision in technology**: The reliability of a system has to be as high as to allow a failure rate of only one in 500 launches.

**Way forward**

• **Creating a separate Space Commerce body** that is independent of ISRO, for space-related activities or a dedicated road map within ISRO for commercial space in India.

• **Promoting startups** as they have potential of leapfrogging product/service offerings out of India and are scalable globally.

• **ISRO providing mentorship** allowing private sector to leverage technical expertise built by ISRO in an appropriate manner.

• **Enactment of space legislations**: To define regulatory, legal and procedural regimes with transparent timelines for pursuing space activities by private space industry.

• **Draft Space Activities Bill, 2017** was proposed to promote and regulate space activities of India. It talked about participation of private sector agencies in space activities in India under guidance and authorization of Department of Space.

**Conservation, environmental pollution and degradation, environmental impact assessment**

Montreal Protocol’s accomplishments are unprecedented and it continues to provide an inspiring example of what international cooperation at its best can achieve. Elaborate. (150 words, 10 marks)

**Introduction**

The Montreal Protocol on Substances that Deplete the Ozone Layer is the landmark multilateral environmental agreement that regulates the production and consumption of nearly 100 ozone depleting substances (ODS). The Montreal Protocol sits under the Vienna Convention for the Protection of the Ozone Layer. It phases down the consumption and production of the different ODS in a step-wise manner, with different timetables for developed and developing countries. Developing and developed countries have equal but differentiated responsibilities, but most importantly, both groups of countries have binding, time-targeted and measurable commitments.

**Body**
Montreal protocol: Accomplishments of the most successful global climate treaty

- The Montreal Protocol mandated the complete phase-out of CFCs and other ozone-depleting substances (ODS), which it has successfully managed to do in the last three decades.

- The protocol was adopted in 1987, becoming the only United Nations treaty to be ratified by its 198 member-states.

- The Montreal Protocol has led to the phase-out of 99 per cent of ozone-depleting chemicals in refrigerators, air-conditioners and many other products.

- From 1989–2013, the protocol’s ban on certain chemicals reduced cumulative CO2-equivalent emissions by 135 billion tons.

- This effort has led to the healing of the ozone layer hole which, in turn, protects humans, economies, and ecosystems.

- Researchers believe that the size of the ozone hole has shrunk by around 4 million sq. km since 2000 and is not as deep as it used to be, thanks to the collective efforts of nations to cut the use of chlorofluorocarbons and other dangerous gases.

- At projected rates, Northern Hemisphere and mid-latitude ozone will heal completely by the 2030s. The Southern Hemisphere will follow in the 2050s and Polar Regions by 2060.

- The Montreal Protocol offers a model of a successful environmental treaty that brought nations together to act swiftly on protecting the ozone layer.

- In 2016, Nations that were party to the protocol got together in Kigali, Rwanda, to discuss the phasing down of hydrofluorocarbons (HFCs) as the next step towards addressing ozone depletion, also necessary to curb global warming.

- Kigali Amendment to Montreal Protocol came into effect in 2019.

Key takeaways from Montreal protocol which acts as an example for other global initiatives

- **Comprehensive negotiations:** From the start, negotiation relied heavily on leadership and innovative approaches. Much negotiation was held in small, informal groups. This enabled a genuine exchange of views and the opportunity to take some issues on trust, such as the subsequent development of the Multilateral Fund. The people negotiating the treaty also included scientists, which lent credibility.

- **Universal consensus:** The Montreal Protocol is the only universal UN Agreement, signed by 196 states and the EU. It has more signatories than any other international agreement or body, including the United Nations itself.

- The Montreal Protocol also called for Multilateral Fund, established in 1990, which was “basically money contributed by developed countries and renewed periodically that paid developing countries and developing country industries to make the switches to the new generations of chemicals,

- **The idea of using trade policy as a punishment mechanism:** Due to this readily definable cause and effect relationship, the Montreal Protocol was able to establish strong enforcement provisions as well as strong commitments.
• **Adjustment provision**: The science was not definite at the time of adoption of the Montreal protocol, so the negotiators developed a highly flexible instrument which could increase or decrease controls as the science became clearer. This flexibility meant the protocol could be amended to include stricter controls: more ozone-depleting substances added to the control list and total phase-out, rather than partial phase-out, called for.

• **Developing countries are given more time to** comply with the phase out decisions, and also they receive funding from the Multilateral Fund to facilitate compliance with the Protocol’s provisions.

**Conclusion**

The Montreal Protocol provides us with a good model of the future, showing a successful execution of international environmental policy. Sure, the Montreal Protocol differs from the Paris Agreement, but we can only stand to gain from studying the former’s success. There’s still time to reach a manageable and sustainable future, but to do that, we must pull out all the stops. That includes learning from our past.

Wetlands play a critical role in maintaining many natural cycles and supporting a wide range of biodiversity. Elucidate (150 words, 10 marks)

**Introduction**

Wetlands are ecotones between terrestrial and aquatic ecosystems. They get periodically get inundated with water. They support a flourishing community of aquatic organisms including frogs and other amphibians. Swamps, marshes and mangroves are examples of wetlands. Wetlands are indispensable for the countless benefits or “ecosystem services” that they provide humanity, ranging from freshwater supply, food and building materials, and biodiversity, to flood control, groundwater recharge, and climate change mitigation.

The total number of Ramsar sites in India are 46 in the country. Wetlands declared as Ramsar sites are protected under strict guidelines.

**Body**

Critical role played by Wetlands in the Ecological conservation of Earth:

• **Carbon Sequestration**: Swamps, mangroves, peat lands, mires and marshes play an important role in carbon cycle. Wetland soils may contain as much as 200 times more carbon than its vegetation.
  
  o g.: In India, coastal wetlands are playing a major role in carbon sequestration. The total extent of coastal ecosystems (including mangroves) in India is around 43000 km. Overall, mangroves are able to sequester about 1.5 metric tonne of carbon per hectare per year and the upper layers of mangrove sediments have high carbon content, with conservative estimates indicating the levels of 10 percent.

• **Flood attenuation**: Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and flood waters. Many water-stressed regions in South Africa are subject to high intensity rainfall over very short periods, often resulting in
flash floods. Wetlands are effective in spreading out and slowing down floodwaters, thereby reducing the severity of floods downstream.

- **g.** A large network of lakes and ponds in major cities like Srinagar, Bhopal, Bengaluru, Chennai and Hyderabad were constructed with the objective of flood control.

- **Regulation of stream flow & groundwater recharge:** wetlands are often compared to sponges, in their ability to absorb water in wet periods, and release it during dry periods. The absorption thus helps in groundwater recharging too.
  
  - **g.** floodplains of rivers like Ganga and Brahmaputra

- **Nutrient assimilation & recycling:** removal by the wetland of phosphates and nitrates carried by runoff water. This takes place through the presence of wetland vegetation and the action of anaerobic bacteria (which would otherwise not exist in fast-flowing, energized streams or rivers). Thus, they help in nutrients recycling and they carry out water purification by filtration of sediments and nutrients from surface water.

- **Erosion control:** wetlands can limit the extent of erosion, predominantly through the protection provided by vegetation, and through their ability to reduce stream flow velocity. Buffer (act as a riparian buffer) shorelines against erosion and pollutants.
  
  - **g.** the mangroves along the sea shores, especially on the western coast in West Bengal and Odisha have been playing a major role in protecting the coastal environment from the destruction of cyclones that frequently emanate in the Bay of Bengal.

- **Microclimate regulation:** Wetland ecosystems play an important role in regulating local and regional climates through evaporative cooling effects that affect the exchange of energy and water with atmosphere.
  
  - **g.** For every land cover type in wetlands, vegetation has a better stabilizing effect on temperature, whereas a water body has a better stabilizing effect on wind speed and humidity. Dal lake in Kashmir has a cooling effect on surroundings.

- **Promotes Biodiversity:** Wetlands are important in supporting species diversity. Because wetlands provide an environment where photosynthesis can occur and where the recycling of nutrients can take place, they play a significant role in the support of food chains.
  
  - **g.** In India lakes, rivers and other freshwater bodies support a large diversity of biota representing almost all taxonomic groups. For example, freshwater ecosystems of Western Ghats alone have 290 species of fish. Similarly, Loktak Lake is famous for being the only refuge of the endangered Sangai (Manipur brow-antlered deer).

- **Productive Ecosystem:** Wetlands are among the most productive ecosystems in the world, comparable to rain forests and coral reefs. An immense variety of species of microbes, plants, insects, amphibians, reptiles, birds, fish and mammals can be part of a wetland ecosystem.
  
  - **g.** In many such wetland areas of India, like Bharatpur wild life sanctuary in Rajasthan, and little Rann of Kutch and coastal areas of Saurashtra in Gujarat, many
migratory species of birds, including siberian crane, from western and European
countries come during winter.

- **Promotes Genetic diversity**: They act as a genetic reservoir for various species of plants,
especially rice.

- **Tourism**: Wet-lands such as coral reefs, beaches, reservoirs, lakes and rivers are considered
to be a significant part of the tourism experience in the country.
  
  - **For instance**, as per an estimate, every year, around seven million tourist visit
    Kerala’s backwaters, beaches and wildlife sanctuaries, 3 million visit Uttarakhand’s
    lakes and other natural wetlands and one million visit Dal lake in Jammu and
    Kashmir.

- **Cultural Significance**: Wetlands especially lakes and ponds are intrinsically linked to the local
culture. They are revered by the masses in recognition of the fact that they are the means of
sustenance of their livelihood.
  
  - **g. Pushkar lake in Rajasthan and Ramappa lake in Telangana**

**Measures needed**

- **Protection**: The primary necessity today is to protect the existing wetlands. Of the many
  wetlands in India only around 68 wetlands are protected. But there are thousands of other
  wetlands that are biologically and economically important but have no legal status.

- **Planning, managing and monitoring**: Wetlands that come under the Protected area network
  have management plans but others do not. It is important for various stakeholders along
  with the local community and corporate sector to come together for an effective
  management plan. Active monitoring of these wetland systems over a period of time is
  essential.

- **Comprehensive inventory**: There has been no comprehensive inventory of all the Indian
  wetlands despite the efforts by the Ministry of Environment and Forests, Asian Wetland
  Bureau and World Wide Fund for Nature. The inventory should involve the flora, fauna, and
  biodiversity along with values. It should take into account the various stakeholders in the
  community too.

- **Legislation**: Although several laws protect wetlands there is no special legislation pertaining
  specially to these ecosystems. **Environment Impact Assessment** needed for major
  development projects highlighting threats to wetlands need to be formulated.

- **Coordinated approach**: Since wetlands are common property with multi-purpose utility,
  their protection and management also need to be a common responsibility.

- **Research**: There is a necessity for research in the formulation of national strategy to
  understand the dynamics of these ecosystems. This could be useful for the planners to
  formulate strategies for the mitigation of pollution.

- **Building awareness**: For achieving any sustainable success in the protection of these
  wetlands, awareness among the general public, educational and corporate institutions must
  be created.

**Conclusion**
Communities engage with wetlands in various ways – from seeking livelihoods to spiritual fulfilment. The values community hold for wetlands are expressed in diverse ways. It is important to integrate community linkages in wetlands management planning, and incentivize community stewardship. This is crucial as over 85% of wetlands in India are in the form of village ponds and tanks.

The National Action Plan on Climate Change (NAPCC) adopts a climate strategy that considers both development agendas as well as climate change. Elucidate. (250 words, 15 marks)

Introduction

The National Action Plan on Climate change was formally launched on June 30th, 2008. The NAPCC identifies measures that promote development objectives while also yielding co-benefits for addressing climate change effectively. There are eight “National Missions” which form the core of the National action plan. They focus on promoting understanding of climate change, adaptation and mitigation, energy efficiency and natural resource conservation.

Body

The eight missions under NAPCC are:

- **National Solar Mission**
  - The objective of the mission is to increase the share of solar energy in the total energy mix of the country, while also expanding the scope of other renewable sources.

- **National Mission for Enhanced Energy Efficiency**
  - Mandating specific energy consumption decreases in large energy consuming industries and creating a framework to certify excess energy savings along with market based mechanisms to trade these savings.
  - Innovative measures to make energy efficient appliances/products in certain sectors more affordable.

- **National Mission on Sustainable Habitat**
  - The aim of the Mission is to make habitats more sustainable through a threefold approach that includes: Improvements in energy efficiency of buildings in residential and commercial sector; Management of Municipal Solid Waste (MSW); Promote urban public transport

- **National Water Mission**
  - The National Water Mission aims at conserving water, minimizing wastage and ensuring more equitable distribution through integrated water resource management.
  - The Water Mission will develop a framework to increase the water use efficiency by 20%.
It calls for strategies to tackle variability in rainfall and river flows such as enhancing surface and underground water storage, rainwater harvesting and more efficient irrigation systems like sprinklers or drip irrigation.

- **National Mission for Sustaining the Himalayan Ecosystem**
  - The Plan calls for empowering local communities especially Panchayats to play a greater role in managing ecological resources.
  - It also reaffirms the following measures mentioned in the National Environment Policy, 2006.

- **National Mission for a Green India**
  - This Mission aims at enhancing ecosystem services such as carbon sinks.
  - It builds on the Prime Minister’s Green India campaign for afforestation of 6 million hectares and the national target of increasing land area under forest cover from 23% to 33%.
  - It is to be implemented on degraded forest land through Joint Forest Management Committees set up under State Departments of Forests.
  - These Committees will promote direct action by communities.

- **National Mission for Sustainable Agriculture**
  - The aim is to make Indian agriculture more resilient to climate change by identifying new varieties of crops, especially thermal resistant ones and alternative cropping patterns.
  - This is to be supported by integration of traditional knowledge and practical systems, information technology and biotechnology, as well as new credit and insurance mechanisms.

- **National Mission on Strategic Knowledge for Climate Change**
  - This Mission strives to work with the global community in research and technology development and collaboration through a variety of mechanisms and, in addition, will also have its own research agenda supported by a network of dedicated climate change related institutions and universities and a Climate Research Fund.
  - The Mission will also encourage private sector initiatives for developing innovative technologies for adaptation and mitigation.

**Limitation of the above to tackle climate change**

- The plan report makes no commitment to cut the country’s carbon emission which should have been an integral part of it.

- The focal point of NAPCC seems to be solar power mission only and the government’s efforts to maximise the solar energy seemingly approve it.

- Missions related to sustainable habitat, water, and agriculture and forestry are multi-sectoral, overlapping, multi-departmental, advisory and very slow moving in nature.
• Several ongoing activities are in principle aligned with the objectives of these missions which should either be integrated with the missions or scrapped to save the time and cost.

• Another challenge is the monitoring systems, which are either ineffective or absent.

• Progress reports for NSM, NMEEE, and NWM are currently available but mapping of progress for other missions has been difficult due to their cross-cutting nature.

• The cross-cutting subjects of the missions have not yielded any positive results on grounds yet so a new approach is needed to solve this and bring the agenda of climate change to the mainstream.

Conclusion

By releasing the NAPCC, the Indian government has shown its commitment to address climate change issues and also sent a positive message to the public, industries, and civil society about the government’s concern to address the climate change issue through concerted action. Issues related to the awareness regarding global warming and climate change among the general population and the issue related to agriculture and health hazards due to climate change must be addressed strongly and effectively.

India is in the mid of an unprecedented expansion in the renewable energy sector. In this context, examine its negative impact on ecology and human livelihood. How can we mitigate those impacts? (250 Words)

Difficulty level: Moderate
Reference: The Hindu
Why the question:
The article explains the negative impact as well as opportunities for a sustainable renewable transition for India.

Key Demand of the question:
Examine the negative implications of the expansion of renewable energy. Suggest ways to mitigate it. Substantiate your answer with examples

Directive word:
Examine – When you are asked to examine, you have to probe deeper into the topic, get into details, and find out the causes or implications if any.

Structure of the answer:
Introduction:
Give a brief introduction of the status of renewable energy presently deployed as well as future plans of India

Body:
Give a detailed description of various negative implications of the unhindered expansion of renewable energy such as solar, wind, etc. For example, impact on biodiversity-rich Open Natural Ecosystems (ONE).
In the next part, give innovative suggestions, including what the government is doing, for mitigation of the negative impact e.g. use of Roof-top Solar Panels or use of Agrivoltaics on degraded agricultural land.

Conclusion:
You may conclude by:
While it is true that renewable energy projects seek to reduce our reliance on an energy economy pivoted on fossil fuels, more attention needs to be paid to how and where these projects are established and the impact these have on ecology and human life.

Introduction

Global concerns about mitigating climate change and reducing greenhouse gas emissions have led to innovations in the energy sector. Across the world, 192 countries have announced policies to promote renewable energy and are looking to expand the installation of renewable energy. Renewable energy is considered as a win-win solution because it allows us to mitigate climate change without sacrificing economic development. Indeed, renewables are poised as the energy choice of the future.

Body

India and her Mega renewable energy projects:

- In 2015, under its international climate change commitments, India had promised to cut down its emissions intensity by 33-35% by 2030 and have 40% of its power, around 350,000 MW installed capacity, from renewable power.
- Consequently, India is racing to achieve a target of installing 175,000 MW of renewable energy power by 2022, a commitment it made as part of its global climate goals.
- At present, India’s installed renewable energy capacity is about 89,635 MW (as on 31 December 2020) only which means that in the next two years India needs to nearly double it to achieve the required target.
- But India is lagging behind the target of 40,000 MW of rooftop solar – which was the vital part of the 175,000 MW target.
- In such a scenario, the government is probably looking at developing large solar parks and wind parks to bridge the gap.
- Recently, the government in Gujarat cleared land allotment of about 60,000 hectares in Kutch region for the development of 41,500 MW mega solar and wind energy park that is estimated to attract investment of around Rs 1.35 trillion.

Social impacts:

- The following social benefits can be achieved by renewable energy projects: local employment, better health, job opportunities, and consumer choice.
- However, renewable power projects pose equal if not a greater threat to ecological biodiversity and cause wide-scale dispossession of lands and livelihoods.
- Large scale solar or wind energy farms require areas of contiguous land.
- The availability of land is contentious, especially in developing countries.
- Renewable energy projects, particularly wind and hydro, compete with local livelihoods, conservation interests and other development activities.
- Additionally, these projects often entail a process where development is usually prioritized over conservation, and livelihood activities.
• Shepherds, landless labourers and others depending on common lands for their livelihoods are neither being consulted before a project is set up nor are they compensated for their losses.

• This leads to slew of issues among the local people like land alienation, poverty, health issues, psychological issues, migration etc.

• Case study:
  o In India all development projects, including renewable energy, are required to gain consent from village level panchayats.
  o In most cases, the certificate of consent from village level panchayats provides mere lip service.
  o The project developers often use empty claims of providing electricity and economic benefits to impoverished, local communities in order to jumpstart the projects.
  o There is no mechanism to monitor how much electricity will be provided and to how many households at the local level.
  o A case in point is the 113 MW, Andhra lake Wind power project, promoted by the multi-national Enercon, on the outskirts of Bhimashankar Wildlife Sanctuary in the Western Ghats of Maharashtra.
  o The villagers who live next to the project site don’t have access to electricity, even though the project threatens their livelihoods and the rich biodiversity of the region.

Ecological impacts:

• One major complaint against the rapid clean energy transition is that it is usurping fertile agricultural land and massively impacting avifauna.

• In India, forest lands are the default choice of location for wind and hydel power project developers.

• It is cumbersome to negotiate private land deals and agricultural land needs to be converted to commercial land, in order to be procured for renewable energy development.

• In comparison, it is relatively easier for renewable energy projects to get approval from the federal and regional forest departments, because they are considered ‘sustainable’.

• Setting up of a renewable energy project requires felling of trees, laying transmission lines and constructing a sub-station for relaying the electricity to the grid.

• The wind turbines are massive structures that need to be hauled to higher altitudes thereby significantly affecting the ecology of the landscape.

• In high rainfall areas, these changes could lead to landslides, floods, conflicts with local livelihoods, and massive soil erosion.

• Case Study:
  o In late 2020, a news report highlighted that the Gujarat government has plans to develop a 41,500-megawatt (MW) hybrid renewable energy park in Kutch.
The state government has cleared the revenue department’s proposal for allotment of 60,000 hectares of land — nearly the size of Greater Mumbai — for this project.

The land finalised for the Kutch project is considered “wasteland” by the government but that may not be the case for the local people and could be an important area for them.

In Kutch, there are many protected areas and they need to be preserved.

If one looks at Kutch there is a huge wetland Shakoor Lake which falls in both India and Pakistan.

This region is home to hundreds of bird species and its adjoining areas are also prime habitat for the vultures and flamingos.

There are many studies by reputed institutes like Wildlife Institute of India that have warned against the death of birds due to collisions with power lines.

The area is also part of the Central Asian Flyway.

The Rajasthan High Court stayed work related to a solar energy park in Rajasthan over land issues after locals filed a case against the land allocated for the project which the Rajasthan government had termed as a wasteland.

Measures needed

- RE plants need to be allotted go/no-go zones where they can and cannot be set up, based on ecological and livelihood sensitivity of the regions.
- A fair and transparent public-hearing process is crucial for any development project.
- Independent EIA Authority and Sector wide EIAs needed.
- Creation of a centralized baseline data bank.
- Dissemination of all information related to projects from notification to clearance to local communities and general public.
- All those projects where there is likely to be a significant alternation of ecosystems need to go through the process of environmental clearance, without exception.
- No industrial developmental activity should be permitted in ecologically sensitive areas.
- Public hearings should be applicable to all hitherto exempt categories of projects which have environmental impacts.

Way forward

- Even as renewable power projects pose equal if not greater threat to ecological biodiversity and cause a wide-scale dispossession of lands and livelihoods, they are rarely critiqued.
- The state should take into account the precarity of local populations that depend upon natural resources for their livelihoods while encouraging renewable energy projects.
- Some probable solutions include giving greater powers to the village level panchayats, making EIA mandatory for all renewable energy projects and ensuring economic as well as electricity access for people who live in close proximity to renewable energy projects.
As increasing number of practitioners, policy makers across countries are focused on fostering renewable energy; it is even more crucial to examine the complex and layered ways in which such projects are operationalized.

What do you understand by Green Deal? Does India need such a green deal on the lines of European Union countries to mitigate the challenge of emissions and equity? Examine (250 Words)

Level: Difficult
Reference: Indian Express

Why the question:
On the lines of the EU green deal, the author in the article has proposed that India should also have a green deal to fulfill its target of COP26 as well as ensure equity

Key Demand of the question:
Define what is green deal and examine its applicability for India

Directive:
Examine – When asked to ‘Examine’, we must investigate the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications.

Structure of the answer:
Introduction:
Give the context of the Question in light of India’s commitment to COP26 and the EU green deal or simply define the Green deal with an example

Body:
Mention a few points about the EU green deal e.g. EU came up with an announcement on additional measures to curb carbon emission. It would bring a law that would be binding on every member to ensure it becomes “climate neutral” by 2050.

Then enumerate how India can bring such a measure for the green deal. Also, highlight the challenges that it may face.

Conclusion:
Conclude with the importance of measures to curb carbon emission.

Introduction
The European Union came up with climate action plan on additional measures it would on climate change, called the European Green Deal, on the side-lines of COP25 in Madrid in 2019. EU with 28 member countries are together the third-largest emitter of greenhouse gases in the world after China and the United States. Therefore, the announcement was hailed as a major step forward, even though it needs complementary efforts from other countries to make a significant impact.

An Indian Green Deal, on the lines of EU Green deal, would simultaneously solve two of the most pressing challenges of today — emissions and equity.

Body

Overview and key features of the European Green Deal:

Climate neutrality

- The EU has promised to bring a law, binding on all member countries, to ensure it becomes “climate neutral” by 2050.
Absorption can be increased by creating more carbon sinks like forests, while removal involves technologies like carbon capture and storage.

Increase in 2030 emission reduction target

- In its climate action plan declared under the Paris Agreement, the EU was committed to making a 40 per cent reduction in its emissions by 2030 compared to 1990 levels.
- It is now promising to increase this reduction to at least 50 per cent and work towards 55 per cent.

Sectoral Plans

- It includes sectoral plans to achieve these targets which include making the steel industry carbon-free by 2030, new strategies for transport and energy sectors, a revision of management of railway and shipping to make them more efficient and more stringent air pollution emission standards for vehicles.

Need for Climate action plan like EU Green deal for India

- According to a recent study on the report “Preparing India for Extreme Climate Events” released by the Council on Energy, Environment and Water (CEEW), over 75% of districts in India are hotspots of extreme climate events such as cyclones, floods, droughts, heat waves and cold waves.
- The melting of the Himalayan glaciers that prompted the floods and landslides in Uttarakhand have the fingerprints of global warming.
- In 2013, glacial flooding caused over 6,000 deaths in Uttarakhand during the monsoon months.
- Furthermore, as glacier cover is replaced by water or land, the amount of light reflected decreases, aggravating warming — a contributor to the sweltering heat in cities like Delhi and Hyderabad, or the epic floods in Chennai or Kerala.
- Super cyclones like Amphan in the east or Tauktae in the south, severe droughts in Maharashtra, incessant rains, and flooding in Chennai or Uttarakhand, and Delhi on a complete lockdown due to extremely poor air quality are few of the climate emergencies which India is facing.

Possible outcomes

- Indian Green Deal could have 3 components – Infrastructure development, care economy, and a green energy programme.
- The green energy programme would result in curbing India’s total carbon emissions by 0.8 gigatonnes by 2030 as compared to the projections based on the Stated Policies Scenario (STEP) by the International Energy Agency (IEA).
- India’s use of energy per unit of GDP (energy intensity) is substantially higher than the global average, which can be significantly reduced through the first component.
- As a result, India would save almost one-third of the energy it would have used in the absence of the programme.
• The employment generating capacity of these sectors is quite high. Based on the PLFS May 2019 report on employment, Indian Green Deal could absorb those who are currently unemployed, it also generates extra jobs, which can certainly absorb a significant section of disguised unemployment.

Way forward

• To hold the elite responsible, IGD can be made into a revenue-neutral policy where part of the expenditure is financed through an increase in taxes on luxury items, wealth and inheritance taxes, which are either low or non-existent in India.

• Another part can be financed by a carbon tax, which also addresses emissions but would be regressive, unlike the other taxes.

• To compensate for that, a carbon dividend — in the form of free electricity, public transport, and free rations — can be built into the policy proposal.

Examine the constraints for India in its transition towards a clean energy system. Also, suggest measures to overcome them. (250 Words)

Difficulty level: Moderate
Reference: The Indian Express, Niti Aayog Report

Why the question:
India is facing the paradox of having to balance its immediate need for fossil fuel for its energy security with the long-term need for clean energy transitions. The article tries to suggest policy measures that India can follow to overcome it. It has been recently in News due to India’s ambitious pledge at COP26 for a Net-Zero economy by 2070.

Key Demand of the question:
Briefly describe the challenges for clean energy transition and measures to overcome them.

Directive word:
Examine – When you are asked to examine, you have to probe deeper into the topic, get into details, and find out the causes or implications if any.

Structure of the answer:
Introduction:
Introduce with the current status of energy dependency and efforts for clean energy transition by India.

Body:
Give a detailed description of constraints with the clean energy transitions such as clean energy transition will be long and expensive, fossil fuels will dominate the energy basket during this transition phase, “OPEC plus” will resurge in market influence, etc.

Then suggest what measures can be taken e.g. create a facilitative ecosystem for the search and development of the minerals and metals required for clean energy, create a “clean energy aatmanirbhar supply chain”.

Conclusion:
Conclude by saying that despite constraints, the long-term sustainability of our energy security heavily relies on the pace of clean energy transitions. You can cite some country which has successfully transitioned their energy need to clean energy.

Introduction

Clean energy is energy that comes from renewable, zero emission sources that do not pollute the atmosphere when used, as well as energy saved by energy efficiency measures. In other words, it is the energy derived from renewable, zero-emissions sources (“renewables”), as well as energy saved through energy efficiency (“EE”) measures.
Clean energy is energy gained from sources that do release air pollutants, while green energy is energy derived from natural sources. There is a degree of crossover between clean energy and green or renewable energy sources, but they are not exactly the same. The perfect clean energy mix occurs where green energy meets renewable energy, such as with solar energy and wind energy.

**Body**

**Clean energy Sources:**

- Sunlight
- Wind power
- Hydro or water power
- Geothermal power
- Biomass

**What is “Clean Energy”?**

Clean energy works by producing power without having negative environmental impacts, such as the release of greenhouse gases like carbon dioxide. A lot of clean energy is also renewable, including wind power, some hydro resources and solar powered energy generation.

**Prospects for India:**

- Clean energy provides a variety of environmental and economic benefits, including a reduction in air pollution.
- NITI Aayog and Rocky Mountain Institute (RMI) have released *Towards a Clean Energy Economy: Post-Covid-19 Opportunities for India’s Energy and Mobility Sectors* report.
- The report states that India’s transport sector can save 1.7 gigatonnes of cumulative carbon dioxide emissions.
- It can also avoid about 600 million tonnes of oil equivalent in fuel demand by 2030.
- A diverse clean energy supply also reduces the dependence on imported fuels and the associated financial and environmental costs this incurs.
• Renewable clean energy also has inherent cost savings, as there is no need to extract and transport fuels, such as with oil or coal, as the resources replenish themselves naturally.

• Other industrial benefits of a clean energy mix is the creation of jobs to develop, manufacture and install the clean energy resources of the future.

• There are financial benefits related to clean energy, not least due to the creation of work to improve the infrastructure, manufacture clean energy solutions and install and maintain them.

• Renewable and clean energy are growth sectors as the world begins to move away from fossil fuels, meaning that more opportunities will arise in areas ranging from eMobility to power generation and storage.

• The expertise that comes with developing these next generation power solutions can be of benefit to those that attain it, offering work and contracts to those who are slow to take up clean energy.

Challenges:

• **Availability of Power:** One of the biggest concerns in the field of renewable energy is power generation depending on natural resources that are uncontrollable by humans. For example, solar powered electricity is generated only when sunshine is available and turns off at night; wind energy also depends on the availability of wind, so if the wind speed is very low, the turbine will not turn, and this result in zero power flow to the grid. The uncertainty in energy production in renewable energy technologies is making integration more complex.

• **Power Quality Issues:** Consistently high power quality is needed to ensure stability and high efficiency of the network. It can lead to high costs and equipment failure. Power quality problems include frequency disorder, voltage/current harmonics, low power factor, voltage variation and transmission lines transits.

• **Resource location:** Most renewable energy plants that share their energy with the grid require large areas of space. In most cases, renewable energy sources are dictated by location which can be off-putting to users. Firstly, some renewable energy sources are simply not available in different regions. Secondly, the distance between the renewable energy source and the grid is a major aspect in term of cost and efficiency.

• **Information Barrier:** While this area is improving, there is a lack of information and awareness about the benefits and need of renewable energy. Investment and capital allowances have been made available for the implementation of renewable energies.

• **Cost Issue:** The high initial cost of installation is one of the major hurdles in the development of renewable energy. Although the development of a coal plant requires about $6 per megawatt, it is known that wind and solar power plants also required high investment. In addition to this, storage systems of the generated energy is expensive and represents a real challenge in terms of megawatt production.

Way forward for India:

• India needs to identify strategic opportunities for economic recovery in the short, medium, and long terms that can translate challenges posed by the pandemic into clean energy transition opportunities.
Opportunities in the transport sector include making public transport safe, enhancing and expanding non-motorized transport infrastructure, reducing vehicle kilometres travelled through work-from-home where possible, supporting national strategies to adopt electric vehicles in the freight and passenger segments, and making India an automotive export hub.

In the power sector, opportunities include improving the electricity distribution business and its operations, enabling renewables and distributed energy resources, and promoting energy resilience and local manufacturing of renewable energy and energy storage technologies.

To support growing clean energy, the expansion of transmission infrastructure, for both intra and inter-state should be strengthened.

It should be carefully assessed to ensure that domestic content requirement does not hinder the growth of solar capacity.

Investment in R&D programmes, as well as human resource development is necessary in addition to local content requirements.

Strengthen the institutional structure to facilitate effective flow of central financial assistance. It is also important to strengthen institutional structure to monitor implementation of Government policies and programmes.

The government also needs to ensure that India’s distribution companies have the capacity to continue to purchase renewable electricity, especially if bid prices level off or rise.

Conclusion

Clean energy appears to be the future for the power needs of humanity across the globe as reliance of fossil fuels continues to diminish. As the drive towards clean, green and renewable energy continues to advance, the cost will fall and work will be created to develop and install these new power solutions. More and more people are recognising the environmental, societal and economic benefits of clean energy and, as more cities, states and nations sign up to a green power agenda, this will continue to advance.

Analyse the potential of Hydrogen as a clean energy fuel to meet India’s COP-26 targets. (150 words)

Reference: Down to Earth

Introduction

Hydrogen is all set to play a significant role in decarbonising energy system. The hydrogen economy is an envisioned future where hydrogen is used as fuel for vehicles, energy storage and long-distance transport of energy. The different pathways to use hydrogen economy includes hydrogen production, storage, transport and utilization.

In this regard, A National Hydrogen Energy Mission (NHEM) to transform transportation in India was announced during Union Budget 2021-22.

Body

Potential of Hydrogen Fuel in achieving India’s COP-26 targets:
• Hydrogen is the **lightest and first element** on the periodic table. Since the **weight of hydrogen is less than air**, it rises in the atmosphere and is therefore rarely found in its pure form, H2.

• At **standard temperature and pressure**, hydrogen is a nontoxic, non-metallic, odourless, tasteless, colourless, and highly combustible diatomic gas.

• Hydrogen fuel is a **zero-emission fuel burned with oxygen**. It can be used in fuel cells or **internal combustion engines**. It is also used as a **fuel for spacecraft propulsion**.

• It can be produced from **renewable sources of energy such as solar and wind**. At present, there are a number of ways to produce hydrogen, but the **most common method is natural gas reforming and electrolysis**.

• Its use can **reduce CO2 related emissions significantly** and decarbonise the entire value chain, enabling reduced emissions and climate change threats.

• Hydrogen can also **bridge the gap between supply and demand**, in both a centralized or decentralized manner, thereby **enhancing the overall energy system flexibility**.

• Hydrogen can be used to **meet both seasonal and daily supply-demand mismatch in the case of renewables**.

• At present, the **current global demand for hydrogen is 70 million metric tons**, most of which is being produced from fossil fuels—76% from natural gas and 23% from coal and remaining from the electrolysis of water—consumes 6% of the global natural gas and 2% of the global coal. This results in CO2 emissions of around 830Mt/year out of which only 130Mt/year is being captured and used in the fertilizer industry.

• Much of the hydrogen produced is **used for oil refining (33%), ammonia (27%), methanol production (11%), steel production via DRI (3%)** and others.

### Steps taken by India towards hydrogen economy:

• India has a huge edge in **green hydrogen production** owing to its favourable geographic conditions and presence of abundant natural elements.

• India’s goal of attaining 175 GW of renewable energy capacity by 2022 and to decarbonise by 2050 got an impetus in the Union Budget 2021-22.

• The **National Hydrogen Mission** has created a road-map for this, and pilot projects on blue hydrogen, green hydrogen and hydrogen compressed natural gas (CNG) have been initiated.

• The **proposed introduction of green hydrogen consumption obligations for fertiliser and petroleum refining industry**, indicate the country’s resolve to transition towards an economy fuelled by green hydrogen.

• The government has given impetus in **scaling up the gas pipeline infrastructure** across the length and breadth of the country, and has introduced reforms for the power grid, including the **introduction of smart grids**. Such steps are being taken to **effectively integrate renewable energy in the present energy mix**.

• In October 2020, **Delhi became the first Indian city to operate Hydrogen-enriched CNG (H-CNG) buses** in a six-month pilot project.
• The **Government of India is planning to focus on five key areas**: (a) Research and Development (b) Demand creation (c) how to use it in the industry (d) how to create an ecosystem (e) how to bring it on board along with international partnerships.

**Way forward for India:**

• At this juncture, with a calibrated approach, India can uniquely position itself to take advantage with increasing investment in R&D, capacity building, compatible legislation, and the opportunity for creation of demand among its vast population. Such initiatives can propel India to become the most favoured nation by exporting hydrogen to its neighbours and beyond.

• **Proactive industry collaboration** with the government is key to creating a hydrogen economy in India.

• This will help bring best-in-class hydrogen technology, equipment, and know-how to create a hydrogen supply chain in India — in many cases, these could be “Made in India”.

• By prioritising national hydrogen demonstration projects, innovations to further reduce the cost of hydrogen will become prominent locally.

• A robust policy framework akin to the one that guided the country’s solar revolution could lead to an increase in production and demand of this green fuel.

• The Government of India should consider setting up a multi-agency mission to bring multiple ministries, private industry and academia together in a partnership to scale up the deployment of hydrogen across sectors and industries.

• Having a clear mid-term and long-term target inspires confidence in the private sector to make their investments in a new energy source.

• **Tax benefits** that solar and wind receive should be extended to all players in the green hydrogen ecosystem.

• In the short term, the price of hydrogen generated through steam methane reformation should be capped.

• **Generating hydrogen from biomass** should also be incentivised as it also has the potential to increase farmer incomes.

• India should ramp up international collaborations for more effortless transfer of technology and resources related to hydrogen.

• Low solar prices coupled with pragmatic policies can help India take a leadership position in driving the global hydrogen economy.

• India needs to secure supplies of raw materials that are needed for this technology.

• Major institutions like the DRDO, BARC and CSIR laboratories have been developing electrolyser and fuel-cell technologies, which could further boost hydrogen economy.

• There is a need for a manufacturing strategy that can leverage the existing strengths and mitigate threats by integrating with the global value chain.
Conclusion

Green hydrogen is one of the most promising fuels in the efforts to reduce carbon emissions. Green hydrogen energy is vital for India to meet its Nationally Determined Contributions and ensure regional and national energy security, access and availability. Hydrogen can act as an energy storage option, which would be essential to meet intermittencies (of renewable energy) in the future.

Value addition:

Challenges:

• One of the biggest challenges faced by the industry for using hydrogen commercially is the economic sustainability of extracting green or blue hydrogen.

• The technology used in production and use of hydrogen like Carbon Capture and Storage (CCS) and hydrogen fuel cell technology are at nascent stage and are expensive which in turn increases the cost of production of hydrogen.

• Several challenges in scaling up the commercial-scale operations of green hydrogen persist.

• Maintenance costs for fuel cells post-completion of a plant can be costly.

• The commercial usage of hydrogen as a fuel and in industries requires mammoth investment in R&D of such technology and infrastructure for production, storage, transportation and demand creation for hydrogen.

• Another key challenge has been portability and transporting the gas.

• Currently costs of production of Green Hydrogen are too high to be competitive with other fuels.

• Most renewable energy resources that can produce low-cost electricity are situated far from potential demand centres.

Discuss the ways in which India can achieve its ambitious ‘Panchamrit’ declaration to tackle climate change. (250 words)

Difficulty level: Moderate.
Reference: sciencealert.com, Insights on India

Key Demand of the question:
To suggest ways for India to achieve its ‘Panchamrit’ declaration.

Directive:
Discuss – This is an all-encompassing directive – you must debate on paper by going through the details of the issues concerned by examining each one of them. You must give reasons for both for and against arguments.

Structure of the answer:
Introduction:
Begin by giving context regarding India’s announcement at cop-26 at Glasgow.

Body:
First, mention the five components of ‘Panchamrit’ declaration. Next, suggest innovative measures that India can take to cut down emissions – mainstreaming solar, harnessing nuclear energy, moving towards EV, bio fuels, carbon capture and storage etc.
Conclusion: Conclude with a way forward.

Introduction

At the 26th Conference of Parties (CoP26), Indian Prime Minister Narendra Modi declared a five-fold strategy — termed as the panchamrita — to achieve this feat.

Body

Panchamrit strategy

The five-fold strategy include:

- India will get its non-fossil energy capacity to 500 gigawatt (GW) by 2030
- India will meet 50 per cent of its energy requirements from renewable energy by 2030
- India will reduce the total projected carbon emissions by one billion tonnes from now onwards till 2030
- By 2030, India will reduce the carbon intensity of its economy by less than 45 per cent
- So, by the year 2070, India will achieve the target of Net Zero.

Areas of Action in the Next 30 Years

1. Grow the power sector by a factor of more than four in 30 years, dominated by renewables.
2. Target 13% hydrogen in final energy, including as a fuel for industry and transport.
3. Transform bioenergy, with liquid biofuels surpassing petroleum products by 2040 to fuel industry and transport, including hard-to-abate sectors such as aviation.

Ways to achieve ambitious ‘Panchamrit’ declaration:

- **Focus on Energy Efficiency:**
  - Will need energy efficient buildings, lighting, appliances and industrial practices to meet the net-zero goal.

- **Increased usage of Biofuels:**
  - Can help reduce emissions from light commercial vehicles, tractors in agriculture.
  - In aviation, the only practical solution for reducing emissions is greater use of biofuels, until hydrogen technology gains scale.

- **Transition towards Electric vehicles:**
  - This will further help curb the carbon emissions.

- **Carbon Sequestration:**
India will have to rely on natural and man-made carbon sinks to soak up those emissions. Trees can capture 0.9 billion tons; the country will need carbon capture technologies to sequester the rest.

- **Carbon Pricing:**
  - India, which already taxes coal and petroleum fuels, should consider putting a tax on emissions to drive change.

- **Deploying lower-carbon Energy:**
  - There are four main types of low-carbon energy: wind, solar, hydro or nuclear power. The first three are renewable, which means these are good for the environment – as natural resources are used (such as wind or sun) to produce electricity.
  - Deploying lower carbon energy would help address both domestic and international climate challenges while simultaneously improving the economic well-being of India’s citizens.

- **Mainstreaming Renewable energy:**
  - India’s energy mix is dominated by coal powered electric generation stations as of now.
  - The need of the hour is increase the share of renewable energy in this energy mix.

**Way forward for India:**

- Given the massive shifts underway in India’s energy system, we would benefit from taking stock of our actions and focusing on near-term transitions.
- This will allow us to meet and even over-comply with our 2030 target while also ensuring concomitant developmental benefits, such as developing a vibrant renewable industry.
- We can start putting in place the policies and institutions necessary to move us in the right direction for the longer-term and also better understand, through modelling and other studies, the implications of net-zero scenarios before making a net-zero pledge.
- It would also be in India’s interest to link any future pledge to the achievement of near-term action by industrialised countries.
- That would be fair and consistent with the principles of the UNFCCC and also enhance the feasibility of our own actions through, for example, increasing availability and reducing costs of new mitigation technologies.

**Value addition**

**Challenges for India to achieve carbon neutrality**

- **India is the world’s third-biggest emitter of GHG.**
- **India’s per capita CO2 emissions – at 1.8 tonnes per person in 2015 – are around a ninth of those in the USA and around a third of the global average of 4.8 tonnes per person.**
India must also meet the aspirations of 1.4 billion people for faster economic development. This will limit India’s development potential.

Meeting the nation’s existing target of 450 gigawatts of renewables by 2030 is already a massive lift. Hitting net zero will require an even more dramatic acceleration.

By 2050, India’s total electricity demand would be about 5500 to 6000 terawatt-hours (TWh), roughly a factor of five on today’s level.

In developed countries, emissions have already peaked. Their decision is only about the path to net-zero. Emerging economies like India, instead, will go through a high-growth phase with rising energy demand and emissions. So, before a net-zero year can be targeted, India must discuss options for its peaking year.

Many argue that net zero is not equitable and fair as it does not differentiate between developing and developed countries in sharing the burden of mitigation.

Some also criticise mid-century net zero as allowing uncontrolled emissions today while relying on uncertain technologies to offset emissions in the future.

Many net zero pledges are premised upon trading and offsetting emissions, allowing the rich to continue emitting and buying their way out.

India is in the mid of an unprecedented expansion in the renewable energy sector. In this context, examine its negative impact on ecology and human livelihood. (150 Words)

Reference: The Hindu

Introduction

Global concerns about mitigating climate change and reducing greenhouse gas emissions have led to innovations in the energy sector. Across the world, 192 countries have announced policies to promote renewable energy and are looking to expand the installation of renewable energy. Renewable energy is considered as a win-win solution because it allows us to mitigate climate change without sacrificing economic development. Indeed, renewables are poised as the energy choice of the future.

Body

India and her Mega renewable energy projects:

• In 2015, under its international climate change commitments, India had promised to cut down its emissions intensity by 33-35% by 2030 and have 40% of its power, around 350,000 MW installed capacity, from renewable power.

• Consequently, India is racing to achieve a target of installing 175,000 MW of renewable energy power by 2022, a commitment it made as part of its global climate goals.

• At present, India’s installed renewable energy capacity is about 89,635 MW (as on 31 December 2020) only which means that in the next two years India needs to nearly double it to achieve the required target.
• But India is lagging behind the target of 40,000 MW of rooftop solar – which was the vital part of the 175,000 MW target.

• In such a scenario, the government is probably looking at developing large solar parks and wind parks to bridge the gap.

• Recently, the government in Gujarat cleared land allotment of about 60,000 hectares in Kutch region for the development of 41,500 MW mega solar and wind energy park that is estimated to attract investment of around Rs 1.35 trillion.

Social impacts:

• The following social benefits can be achieved by renewable energy projects: local employment, better health, job opportunities, and consumer choice.

• However, renewable power projects pose equal if not a greater threat to ecological biodiversity and cause wide-scale dispossession of lands and livelihoods.

• Large scale solar or wind energy farms require areas of contiguous land.

• The availability of land is contentious, especially in developing countries.

• Renewable energy projects, particularly wind and hydro, compete with local livelihoods, conservation interests and other development activities.

• Additionally, these projects often entail a process where development is usually prioritized over conservation, and livelihood activities.

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  o In most cases, the certificate of consent from village level panchayats provides mere lip service.
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  o There is no mechanism to monitor how much electricity will be provided and to how many households at the local level.
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  o The villagers who live next to the project site don’t have access to electricity, even though the project threatens their livelihoods and the rich biodiversity of the region.
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- One major complaint against the rapid clean energy transition is that it is usurping fertile agricultural land and massively impacting avifauna.

- In India, forest lands are the default choice of location for wind and hydel power project developers.

- It is cumbersome to negotiate private land deals and agricultural land needs to be converted to commercial land, in order to be procured for renewable energy development.

- In comparison, it is relatively easier for renewable energy projects to get approval from the federal and regional forest departments, because they are considered ‘sustainable’.

- Setting up of a renewable energy project requires felling of trees, laying transmission lines and constructing a sub-station for relaying the electricity to the grid.

- The wind turbines are massive structures that need to be hauled to higher altitudes thereby significantly affecting the ecology of the landscape.

- In high rainfall areas, these changes could lead to landslides, floods, conflicts with local livelihoods, and massive soil erosion.

Case Study:

- In late 2020, a news report highlighted that the Gujarat government has plans to develop a 41,500-megawatt (MW) hybrid renewable energy park in Kutch.

- The state government has cleared the revenue department’s proposal for allotment of 60,000 hectares of land – nearly the size of Greater Mumbai – for this project.

- The land finalised for the Kutch project is considered “wasteland” by the government but that may not be the case for the local people and could be an important area for them.

- In Kutch, there are many protected areas and they need to be preserved.

- If one looks at Kutch there is a huge wetland Shakoor Lake which falls in both India and Pakistan.

- This region is home to hundreds of bird species and its adjoining areas are also prime habitat for the vultures and flamingos.

- There are many studies by reputed institutes like Wildlife Institute of India that have warned against the death of birds due to collisions with power lines.

- The area is also part of the Central Asian Flyway.

- The Rajasthan High Court stayed work related to a solar energy park in Rajasthan over land issues after locals filed a case against the land allocated for the project which the Rajasthan government had termed as a wasteland.

Measures needed

- RE plants need to be allotted go/no-go zones where they can and cannot be set up, based on ecological and livelihood sensitivity of the regions.
A fair and transparent public-hearing process is crucial for any development project.

Independent EIA Authority and Sector wide EIAs needed.

Creation of a centralized baseline data bank.

Dissemination of all information related to projects from notification to clearance to local communities and general public.

All those projects where there is likely to be a significant alternation of ecosystems need to go through the process of environmental clearance, without exception.

No industrial developmental activity should be permitted in ecologically sensitive areas.

Public hearings should be applicable to all hitherto exempt categories of projects which have environmental impacts.

Way forward

Even as renewable power projects pose equal if not greater threat to ecological biodiversity and cause a wide-scale dispossession of lands and livelihoods, they are rarely critiqued.

The state should take into account the precarity of local populations that depend upon natural resources for their livelihoods while encouraging renewable energy projects.

Some probable solutions include giving greater powers to the village level panchayats, making EIA mandatory for all renewable energy projects and ensuring economic as well as electricity access for people who live in close proximity to renewable energy projects.

As increasing number of practitioners, policy makers across countries are focused on fostering renewable energy; it is even more crucial to examine the complex and layered ways in which such projects are operationalized.

Is Development Opposed To Conservation? Suggest sustainable ways which address the need for both development and conservation effectively. (250 Words)

Reference: The Hindu

Introduction

Development and environment are two sides of the same coin. On one hand people are concerned about the environment in which they live. Major issues like global warming, greenhouse effect, air and water pollution are increasing each day. On the other hand, to eradicate poverty and increase growth in the economy, development is mandatory. Without economic development a nation cannot come out of the vicious circle of poverty. As our population grows, finding a balance between economic advancement and consumption of natural resources is a vital question that India should address.

Body

Developmental goals are breaching the conservation efforts:

- Neglect of environmental principles is a key reason why natural hazards end up causing a significant number of avoidable casualties.
Any exercise to scientifically ascertain the risk from natural hazards to a region are barely implemented in the right spirit.

Unregulated quarrying and the unscientific cutting of slopes into hills aggravates the risk of soil erosion and subsequently increases the risk of landslides.

In pursuit of providing welfare to vulnerable sections of society, the government has provided a bulk of subsidies.

However, subsidised nature of services like energy and electricity leads to their overuse and undermines environmental sustainability.

Further, subsidies also undermine the revenue base and limit the government’s capacity to invest in new, cleaner technologies.

Access to natural resources is entirely open and no individual user bears the full cost of environmental degradation and resources are consequently overused.

Increasing population tends to exacerbate the linkages between underdevelopment and environmental degradation.

Further, poverty generates significant incentives to raise large families and stimulate migrations, which makes urban areas environmentally unsustainable.

Both outcomes increase pressure on resources and consequently worsen environmental quality, diminish productivity and reinforce poverty.

Measures needed:

- **Role of Enterprises:**
  - Production systems must become sustainable.
  - Switching from non-renewable to renewable sources of energy and materials targeting cleaner production.
  - Improving energy efficiency in industry is one of the most cost-effective measure.
  - Maximising recycling and reuse of wastes.
  - Industries across sectors must come together on a common platform to address the issues concerning economic development and environment protection.
  - Market-based instruments such as pollution tax and tradable pollution permits must be carried out.

- **Role of Government:**
  - Policies need to be simplified to create an ecosystem for new sustainable businesses to flourish.
  - Economic policies such as rationalization of price subsidies, the clarification of property rights, facilitation of technology transfer may help in achieving environmental sustainability.
  - ICT can help drive socio-economic achievements via e-health, e-government services and smart grids for utilities.
Good environmental governance which limits exploitation of natural resources to sustainable levels.

Our policy should not be based on the “pollute-first; clean-up-later” approach.

We need to strengthen participatory processes such as public hearings in the environmental and forest clearance process.

Developing and reporting measures of human well-being other than GDP that better account for environmental and social costs of resource use.

The Green GDP is a step forward for India if it wishes to account for true economic growth and its holistic wealth.

Strict environmental regulation may reduce environmental damage significantly.

India should work with foreign governments and global organizations to find ways of subsidizing clean fuel and cleaning our rivers and aquifers.

Regions and countries can benefit from the knowledge of indigenous people and their understanding of large ecosystems.

Thus, Governance, including customary institutions and management systems should involve indigenous peoples and local communities to safeguard nature and understand climate change.

The linkage of biodiversity and environmental sustainability highlights the critical need to integrate biodiversity considerations in global decision-making.

Conclusion

Development remains the greatest pursuit as well as a challenge, faced by humanity. However, despite the unprecedented economic and social progress that has been made over the last century, poverty, famine and environmental degradation still persist on a global scale. Moreover, environmental deterioration and climate change have started to show irrevocable damages to the developmental progress made so far. Thus, development goals must be pursued without breaching environment regulations.

What is the difference between forest area and forest cover? Why is it important to improve the forest cover in the country? Discuss in light of recent Forest Survey report 2021. (250 Words)

Introduction

The National Forest Policy of India, 1988 envisaged a goal of achieving 33 per cent of the geographical area of the country under forest & tree cover. India State of Forest Report (ISFR) is a biennial publication of Forest Survey of India (FSI), an organization under the Ministry of Environment, Forest & Climate Change, Government of India.
Difference between forest area and forest cover

- The term ‘Forest Area’ (or recorded forest area) generally refers to all the geographic areas recorded as forest in government records.

- On the other hand, the term ‘Forest Cover’ refers to all lands more than 1 hectare in area, having a tree canopy density of more than 10%.

- Thus, the term ‘forest area’ denotes the legal status of the land as per the government records, whereas the term ‘forest cover’ indicates the presence of trees over any land.

Concerns of declining forest cover

- **Decline in Natural Forests:** There is a 1,582 sq. km decline in moderately dense forests, or “natural forests”. The decline, in conjunction with an increase of 2,621 sq. km in open forest areas – shows a degradation of forests in the country.
Also, scrub area has increased by 5,320 sq. km – indicating the complete degradation of forests in these areas.

Very dense forests have increased by 501 sq. km.

**Decline in Northeast Forest Cover:** The forest cover in the region has shown an overall decline of 1,020 sq. km in forest cover.

- The Northeast states account for 7.98% of total geographical area but 23.75% of total forest cover.
- The decline in the North-eastern states has been attributed to a spate of natural calamities, particularly landslides and heavy rains, in the region as well as to anthropogenic activities such as shifting agriculture, pressure of developmental activities and felling of trees.

**Government measures to improve forest areas**

- **National Mission for a Green India**
  - It is one of the eight Missions under the National Action Plan on Climate Change (NAPCC).
  - It was launched in February, 2014 with the objective to safeguard the biological resources of our nation and associated livelihoods against the peril of adverse climate change and to recognise the vital impact of forestry on ecological sustainability, biodiversity conservation and food-, water- and livelihood-security.

- **National Afforestation Programme (NAP):**
  - It has been implemented since 2000 for the afforestation of degraded forest lands.
  - It is being implemented by the MoEFCC.

- **Compensatory Afforestation Fund Management and Planning Authority, (CAMPA Funds)**
  - Launched in 2016, 90% of the fund is to be given to the states while 10% is to be retained by the Centre.
  - The funds can be used for treatment of catchment areas, assisted natural generation, forest management, wildlife protection and management, relocation of villages from protected areas, managing human-wildlife conflicts, training and awareness generation, supply of wood saving devices and allied activities.

- **National Action Programme to Combat Desertification**
  - It was prepared in 2001 to address issues of increasing desertification and to take appropriate actions.
o It is implemented by the Ministry of Environment, Forest and Climate Change.

- **Forest Fire Prevention & Management Scheme (FFPM)**
  - It is the only centrally funded program specifically dedicated to assist the states in dealing with forest fires.

**Conclusion**

With climate change and global warming on the rise, forest hold the key in combating the two. They are a rich source of carbon storage and are key to keep the biodiversity alive. The balance needs to be restored for which forests need to flourish. The pledge to increase forest and stop deforestation must be implemented on war footing.

**Value Addition**

**Forest Survey Findings**

- *The Total Forest and Tree cover is 24.62% of the geographical area of the country.*
  - The Total Forest cover is 7,13,789 sq. km which is 21.71% of the geographical area of the country.
  - The Tree cover is 2.91% of the geographical area of the country.
- *As compared to ISFR 2019 the current assessment shows an increase of:*
  - 0.28% of forest and tree cover put together, at the national level.
  - Forest Cover: 0.22%  
  - Tree Cover: 0.76%
- *Change in Recorded forest Area/Green Wash (RFA/GW) as compared to previous assessment of 2019.*
  - Forest Cover within the RFA/GW: A slight increase of 31 sq. km.
  - Forest Cover outside the RFA/GW: There is an increase of 1,509 sq. km.

While the Extended producer responsibility (EPR) is at a nascent stage in the India, the major issue with it is the lack of accountability from the producers and lack of enforcement from the authorities. Analyse (250 words, 15 marks)

**Introduction**

**Extended Producer Responsibility (EPR)** means the responsibility of a producer for environmentally sound management of the product until the end of its life. In October, the Environment Ministry published draft regulations on Extended Producer Responsibility (EPR), set to come into effect by the end of this year. These regulations denote a backslide, particularly with respect to integration of the informal sector.

**Body**
Background

- Extended Producer Responsibility (EPR) requires the manufacturer of a product, or the party that introduces the product into the community, to take responsibility for its life cycle.
- An FMCG company should not only account for the costs of making, packing and distributing a packet of chips, but also for the collection and recycling/reuse of the packet.
- In India, The Plastic Waste Management Rules, 2016—which is issued under Environment (Protection) Act, 1986- introduced the concept of EPR to manage plastics in India.
- The government has implemented the E-waste (Management) Rules (2016) which enforces the Extended Producer Responsibility (EPR).
- Under EPR principle the producers have been made responsible to collect a certain percentage of E-waste generated from their goods once they have reached their “end-of-life”.

Issues with Extended producer Responsibility

- **Informal work:** By failing to mention waste pickers or outlining mechanisms for their incorporation under EPR, the guidelines are retrogressive. The EPR doesn’t take into account the formalization of informal waste pickers, aggregators and dismantlers.
  - For decades, waste pickers, working in dangerous and unsanitary conditions, have picked up what we throw away.
  - Besides, by diverting waste towards recycling and reuse, waste pickers also subsidise local governments responsible for solid waste management.
- **Inclusion of various processes that are harmful:** Processes like waste-to-energy, co-processing and incineration have been proven to release carbon dioxide, particulate matter, harmful dioxins and furans which have negative climate and health impacts.
  - While the environmental impact and desirability of these processes continues to be debated, the draft regulations legitimise them to justify the continued production of multi-layered plastics.
- **The EPR guidelines are limited to plastic packaging.** There are other multi-material plastic items like sanitary pads, chappals, and polyester that pose a huge waste management challenge today, but have been left out of the scope of EPR.
- **Plastic waste reduction / minimisation is neglected in rules.** Compostable or biodegradable plastic is not under the ambit of EPR.
- **Consumer awareness:** Waste segregation has been the greatest challenge in India owing to lack of consumer awareness.
- **Lack of compliance:** The plastic producers do not wish to engage in the process holistically and take the effort to build awareness.
- **Lack of recycle infrastructure:** These challenges range from lack of handling capacity to illegitimate facilities in the forms of multiple accounting of waste, selling to aggregators and leakages.
Way forward

- The government could support and **strengthen the informal recycling chain** by bridging gaps in adequate physical spaces, infrastructure, etc.

- An effective EPR framework should address the issue of **plastics and plastic waste management in tandem with the existing machinery**, minimise duplication and lead to a positive environmental impact, with monitoring mechanisms including penalties for non-compliance.

- **EPR funds could be deployed for mapping and registration of the informal sector actors**, building their **capacity**, upgrading **infrastructure**, promoting **technology** transfer, and creating closed loop feedback and monitoring mechanisms.

- Market value for the recycled plastics can be increased by **increasing the demand for and use of recycled plastics in packaging**, thus creating the value to accommodate the current costs of recycling.

“We must move away from ‘take, make, use and dispose economy’ to ‘circular economy’”. Describing the concept of circular economy, highlight the steps taken by India to achieve it. (250 Words)

**Level:** Tough

**Reference:** The Hindu

**Why the question:**
The PM in his Davos speech emphasized India’s strength in circular economy and its potential to mitigate the impact of climate change.

**Key Demand of the question:**
Explain the concept of the circular economy. Giving examples, discuss its utility in India.

**Structure of the answer:**
**Introduction:**
A circular economy is a concept describing an industrial economy, which produces no wastes and no emissions through its design, considering all the phases of the life cycle of products.

**Body:**
The answer body must have the following aspects covered:
Discuss the concept in detail – **CE is an industrial system, which is an alternative to the highly extractive and resource-intensive linear economy principle of take-make-dispose.**

CE replaces the end-of-life concept and aims at retaining the value of resources, products, and materials at their highest by keeping them in use as long as possible, minimizing wastage at each life-cycle stage, and extracting the maximum value through reusing, repairing, recovering, remanufacturing and regenerating products and materials at the end of each service value. **Explain the opportunities provided by the CE. Discuss the steps taken by India in achieving it e.g. Draft resource efficiency, MeitY had formulated a policy paper titled “Circular Economy in Electronics and Electrical Sector”**.

**Conclusion:**
Conclude with importance.

**Introduction**
The WEF defines “a circular economy as an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems, and business models”.

With a growing population, rapid urbanization, climate change and environmental pollution, India must move towards a circular economy.

**Body**

The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended.

This is a departure from the traditional, linear economic model, which is based on a take-make-consume-throw away pattern. It relies on large quantities of cheap, easily accessible materials and energy.

**Principles of circular economy**

The following ‘5R’ principles lies at the heart of achieving circularity in any product, process or service:

- **Reduce**: The emphasis is on achieving resource efficiency by prioritizing use of regenerative and restorative resources.
- **Reuse**: This encompasses two aspects – first is to reuse the useful parts / components of a product, wherever possible and second is to promote greater use of product-as-a-service through sharing platforms.
- **Recycle**: Focus is on creating a closed loop system to utilize discarded material as a source of secondary resource, through extensive recycling.
• Re-manufacture: To create new products by utilizing waste streams through cooperation and collaboration between multi-sector industry actors.
• Repair/refurbish: The aim is to preserve and extend the life of a product that is already made by designing for the future

Steps taken by India to promote circular economy

• The Government has been actively formulating policies and promoting projects to drive the country towards a circular economy.
• It has already notified various rules, such as the Plastic Waste Management Rules, e-Waste Management Rules, Construction and Demolition Waste Management Rules, Metals Recycling Policy, etc., in this regard.
• Since its constitution, NITI Aayog too has undertaken several initiatives to ensure sustainable economic growth.
• Direct initiatives were taken to address the challenges in the utilization of waste as resource and to evolve a perspective on the recycling industry in India.
• Progress was made in promoting the usage of fly ash and slag produced in the steel industry in other sectors.
• NITI also organized an international conference on ‘Sustainable Growth through National Recycling’; prepared a strategy paper, along with the EU delegation to India, on ‘Resource Efficiency’, and four more on resource efficiency in the sectors of steel (with the Ministry of Steel), aluminium (with the Ministry of Mines), construction and demolition (with the Ministry of Housing and Urban Affairs) and e-waste (with the Ministry of Electronics and Information Technology).
• To expedite the transition of the country from a linear to a circular economy, 11 committees have been formed—to be led by the concerned line ministries and comprising officials from MoEFCC and NITI Aayog, domain experts, academics and industry representatives—for 11 focus areas.
• The focus areas include 11 end-of-life products/recyclable materials/wastes that either continue to pose considerable challenges or are emerging as new challenge areas that must be addressed in a holistic manner.

Way forward

• Need for Legislation to promote the circular economy in the country. Several countries have recognised the centrality of the circularity as the new paradigm for sustainable development.
• Policies like Zero Effect, Zero Defectin manufacturing stage, National Electricity Mobility Mission Plan in consumption stage, and the various Waste Management Rules in disposal stage, if tweaked properly, can be the ideal for integrating circular economy into the fabric of the Indian economy.
• Ensuring the transition to circular economy call for extensive collaborative efforts between key stakeholders, including regulators, policy makers, corporates, and financial institutions would need to work to adopt circular business models.
• Adequate financing needed for realization of these newer opportunities through innovative financing instruments, such as green bonds, municipal bonds, SDG-aligned bonds.

Conclusion

India has immense resources — people, capital, supply chains and scale — to find value in waste. A billion-dollar-valued circular economy unicorn can indeed emerge if technology, finance, policy and behavioural change could create markets where none existed.

Security challenges and their management in border areas – linkages of organized crime with terrorism.

Enumerate the various challenges faced by India in its land border management. Do you think a single agency to manage all its borders a good idea? Critically comment. (250 words)

Reference: Indian Express

Introduction

India has one of the longest and most varied of international borders. Historical and political reasons have left India with an artificial unnatural border. Border Management is an integral approach towards borders in which along with security enhancement, infrastructure & human development is undertaken. The challenge of coping with long-standing territorial and boundary disputes with China and Pakistan, combined with porous borders along some of the most difficult terrain in the world, has made effective and efficient border management a national priority.

Body:

India has had to deal with numerous challenges with respect to border management such as:

• **Porous borders:** International borders with Pakistan and Bangladesh run through diverse terrain including deserts, marshes, plains and mountains. This porosity of borders facilitates various illegal activities such as smuggling, trafficking of humans, drugs and arms and infiltration.

• **Contested International borders:** History of mistrust and constant border skirmishes with Pakistan along line of control (LOC) makes India highly susceptible to cross-border terrorism. Similarly, India’s border with Myanmar is threatened by several insurgent groups that have found sanctuaries in jungles along the border. Political boundary issues of “enclaves and adverse possessions” in Bangladesh have resulted in political sensitivity along the entire eastern border.

• **Inefficiency in Border management:** Indian borders continue to be guarded by military and police forces that report to different ministries in the Centre and states, making the border management task arduous and leading to duplication of efforts by the security forces.

• **Lack of critical infrastructure:** Critical infrastructure such as observation towers, bunkers, Border Flood Lights etc. are lacking in many border areas which also prevent deployment of hi-tech equipment.

• **Poor intelligence and resource efficiency:** Security forces are ill-equipped to handle border management given poor intelligence capabilities and severe resource deficiency.
**Ethnic conflicts and separatist movements**: 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.

**Over-population in the border areas**: Density of population in the border areas at some places is approximately 700-800 persons per square km on the Indian side and about 1,000 persons on the Bangladesh side.

**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.

The implications on the internal security due to the above challenges of border management is marked by

- increased cross-border terrorism
- infiltration and exfiltration of armed militants
- emergence of non-state actors
- nexus between narcotics traffickers and arms smugglers
- left-wing extremism
- fake Indian Currency network
- separatist movements aided and abetted by external powers
- illegal cattle trade

**Is a single agency managing all its borders a good idea**

- In India, we have unwieldy arrangements. As a result, there is a lack of a coherent policy on training, planning and the conduct of guarding operations among various outfits. Overall coordination is also affected.

- India needs a single security agency adequately equipped, suitably armed and trained in advanced military drills and sub-unit tactics to guard our borders.

- The manpower and infrastructure should be created by pooling and merging the resources of the CAPF and Assam Rifles.

- It augments the battle efficiency, a fixed percentage of manpower, including the officer cadre, should be drawn on deputation from the army.

- It could have the explicit mandate to effectively retaliate against cross-border transgressions and stabilise the situation till the operations are taken over by the armed forces.

**However, entire border management under a single agency has its own drawbacks**

- It would reduce the niche skills of the various forces currently managing the various borders.

- The borders themselves have a huge diversity which could pose huge investment risks on training all soldiers in all types of terrain.

- Further, with more localities getting associated with the forces in the region, it's easier for them to adapt to the environs quickly.
• It could lead to centralization of powers and thus leading to unnecessary redtapism.

Way forward:
• Infrastructure along with border has to be improved – rail connectivity along with road connectivity has to be provided for quick mobilization.
• Building of additional checkpoints and Border posts along major and minor trade routes connected with borders
• Building of floating bridges, walls & electrical fences where there is high probability of infiltration.
• Taking up of joint Border management with Countries like Myanmar, Bhutan and Nepal.
• Improving healthcare, physical infrastructure and digital connectivity in villages around borders thus making them stakeholder in Border Management.
• Madhav Godbole task force recommendations on border management need to be implemented.
• It had recommended that the CRPF should be designated as the primary national level counter-insurgency force. This would enable the other central paramilitary forces like the BSF and Indo-Tibetan Border Police to return to their primary role of better border management.
• It had also recommended that all paramilitary forces managing unsettled borders should operate directly under the control of the army and that there should be lateral induction from the army to the paramilitary forces so as to enhance their operational effectiveness.
• The principle of ‘single point control’ must be followed if the borders are to be effectively managed.
• The advances in surveillance technology, particularly satellite and aerial imagery, can help to maintain a constant vigil along the LAC and make it possible to reduce physical deployment.

Conclusion:
Keeping a strong vigil on its border is very important for any nation to check any kind of illegal activities or intrusion through them. For India, the task becomes difficult where terrain and climate is very complex across some of its border areas. Focussing on improved technology will help in making the task easier for the security forces and make its borders more secure.

What security threats are posed by Drones as a means of hybrid warfare? Can these threats be averted without stifling the growth in the use of Drone technology? Analyze. (250 words)

Reference: The Hindu

Why the question:
Yemen’s Houthi rebels used cruise and ballistic missiles, in addition to drones, in an attack on Abu Dhabi this week that killed three people and set off fires at a fuel depot and an international airport

Key Demand of the question:
Analyse in what way Drones as a technology offer a distinctively puzzling and complex security threat when it comes to terrorism and hybrid warfare.

Directive:
Analyse – When asked to analyse, you have to examine methodically the structure or nature of the topic by separating it into component parts and present them as a whole in a summary.

Structure of the answer:
Introduction:
Start with recent incidences associated with Drone attacks in UAE. Also, give examples of similar incidents in India.

Body:
Drones are useful but also represents the start of a new dimension of hybrid warfare which can have ramification for world security. Also, there have been warnings that Pakistan-based terrorist groups could attempt to target military bases with drones.
Discuss in detail the security threats associated with Drones. Drones have developed significantly and acquired massive leaps in capability.

Weaponized drones were first used by the Islamic State in northern Iraq in 2016 and then in Syria. They have wreaked havoc on Al Qaeda and other terrorist organizations in Afghanistan and other hotspots, used for targeted and precise eliminations by both Israelis and Americans. What makes drones particularly dangerous is the fact that they fly very low making them undetectable to radar and leaving little by way of reaction time once detected.

List down initiatives to regulate drone use in India as a world e.g. drone rules introduced. Also, mention why the regulation should not stifle the innovations in drone technology. Suggest measures to tackle these challenges.

Conclusion:
With the increasing use of drones for cross-border smuggling, the Indian security agencies must look for various ways to put in place reliable systems as part of a smart border management mechanism for deterrence.

Introduction
A Drone is an unmanned aerial vehicle (UAV), an aircraft without a human pilot aboard. Besides combat use, drones are used for a range of purposes like package delivery, in agriculture (spraying pesticides etc), monitoring environmental changes, aerial photography, and during search and relief operations, among others.

Increasing the use of drones in warfare and other areas has brought into focus the potential the use of drones holds and the other issues related to its misuse (Rogue Drones). India has an estimated over 6 lakh rogue or unregulated unmanned aerial vehicles (UAVs).

Body
Security threats posed by drones:

- **National Security Issues:** Drones have demonstrated the potentials for their threat to the security of a country. Drones are operated remotely and can strike where it wants it to strike. Raising serious security issues.

- **Terrorism:** Drones have been used by various terrorist organisations like ISIS in Syria and Iraq to hit their targets.

- **Conflict Zones:** Drones are becoming security threats particularly in conflict zones where non-state actors are active and have easy access to the technology. For example: 2019 twin drone attacks on Aramco crude oil production in Saudi Arabia.
• **Potential weapons of mass destruction:** What makes combat drones in the hands of non-state actors most dangerous is the threat of them being used to deliver weapons of mass destruction.

• **Aviation safety:** Drones flying too close to commercial aircraft has called for regulations.

• **Privacy:** Drones have been used by the paparazzi to take the images of individuals breaching their privacy.

• **Critical infrastructure:** Unregulated drones, UAVs and remotely-piloted aircraft system are a “potential threat” to vital installations, sensitive locations and specific events.

• **Cross border smuggling:** Over the past two years, drones have been deployed regularly by Pakistan-based outfits to smuggle arms, ammunition and drugs into Indian territory. Drones fly low and therefore cannot be detected by any radar system.

**Way forward:**

• Security agencies should work on developing more **modern anti-drone weapons like ‘sky fence’ and ‘drone gun’** to counter terror or similar sabotage bids by these aerial platforms.

• The Tokyo police have been using ‘flying nets’ attached to legal drones to capture and neutralise rogue UAVs. The Taiwanese police have been testing RF jammer guns to bring down rogue drones.

• The other anti-drone technology is through geofencing agreements with commercial drone manufacturers, a technique that will prevent UAVs from flying near critical infrastructure by pre-programmed codes put in by manufacturers.

• India needs to invest more in counter-drone research and technology and procure them in a planned manner to address the security concerns arising from rogue operations the unmanned aerial vehicles.

• There is a need to develop partnerships between counter-drone companies and public sector units (PSUs), government organisations like Defence Research and Development Organisation (DRDO) and other private organisations.

• The Ministry of Civil Aviation could potentially look at making the existing regulations for unmanned aircraft systems more stringent.

• The answer to the emerging threat of rogue drones, though serious, is not over-regulation but smart regulation, creating a balance between the evolving drone sector and the emerging security concerns.

• This needs to be done with investing in cutting-edge technologies for countering drones and indigenous R&D, with the support of government grants besides private investments.

• ‘**National Counter Rogue Drone Guidelines**’ is a step in the right direction outlining ‘procedural means’ of prevention, deterrence and denial and ‘active means’ of detection, interruption and destruction. This must be coupled with ‘Counter Rogue Drone Deployment Plan’ based on vulnerability analysis.

**Conclusion:**
Regulation on use of drones in India should be effectively implemented to foster technology and innovation in the development of drones and improve the ease of doing business, by side-lining unnecessary requirements and creating a single-window process. The government should ensure protection of privacy of citizens by limiting the use of drones for surveillance. It is important to use drones responsibly to minimize negative impacts on wildlife, including birds. Possibilities of drone-related accidents should be minimized by strict enforcement of regulations.

Value addition

Recent events featuring drones

- Recently, Drones were used for the first time to drop explosive devices, triggering blasts inside the Air Force Station’s technical area in Jammu.
- Recently, the BSF detected weapons dropped by a suspected Pakistan drone in Jammu. One AK-47 assault rifle, one pistol, one magazine, and 15 rounds for a 9 mm weapon were recovered 250 m inside Indian territory.
- On June 20 last year, the BSF shot down a drone in Hiranagar, Jammu. The hexacopter’s payload included a US-made M4 semi-automatic carbine, two magazines, 60 rounds and seven Chinese grenades.
- Sources said in recent years there have been an estimated 100-150 sightings of suspected drones near India’s western border annually. Most of these are suspected to be surveillance drones.
- A drone was used by the U.S. to fire the missile at Qassem Soleimani to assassinate him.
- A few days before that, less-lethal drones monitored crowds of student protesters rocking India.

Various security forces and agencies and their mandate

India needs a comprehensive and coordinated approach among its security agencies amidst ever-changing counter-terrorism and security challenges. Discuss (250 Words)

Difficulty level: Moderate
Reference: The Hindu

Why the question:
Security agencies and their working are part of GS Paper 3. The need for synergy and coordination among agencies has been highlighted by India’s Home Minister as well as the parliamentary committee report.

Key Demand of the question:
Explain why security agencies need to coordinate especially state and central agencies and how can they do so.

Directive word:
Discuss – This is an all-encompassing directive – you have to debate on paper by going through the details of the issues concerned by examining each one of them. You have to give reasons for both for and against arguments.

Structure of the answer:
Introduction:
Give a brief introduction of India’s security architecture including the intelligence agencies.

Body:
Highlight the various lacuna in India’s security coordination e.g. non-effective implementation of NatGrid, weakness of multi-agency center (MAC). Also, show how changing the security situation needs much more synergy between various agencies especially the coordination between centre and state.
Afterward, give suggestions for better coordination between agencies such as integration of networks (e.g. currently 429 SMAC nodes and 251 district-police offices are connected to the MAC/SMAC Network), codification of India’s security doctrine, etc.
You may refer to an article on this in Orfonline

Conclusion:
Conclude with a futuristic view about coming threats especially from the cyber domain.

Introduction
The national security threats that India confronts today are much more diverse and complex than ever before. These threats range from nuclear-armed adversaries like China and Pakistan, to Maoists, and militancy and terrorism arising from within its borders and beyond. The question that we must ask is whether the country has a strategic measure of these challenges and the willingness and ability to confront them and, if required, pre-empt them. The tasks before India’s intelligence community are similar to those that are confronted by their counterparts across the world: they relate to strategic intelligence, anticipatory intelligence, current operations, cyber intelligence, counterterrorism, counter proliferation and counter intelligence.

Body
Multi Agency Centre (MAC) is a common counter-terrorism grid under the Intelligence Bureau that was made operational in 2001 following the Kargil War. As many as 28 organisations, including the Research and Analysis Wing (R&AW), armed forces and State police, are part of the platform. The Union government has asked the States to share more intelligence inputs through the MAC.

Need for comprehensive and coordinated approach among its security agencies

- India suffers from inadequate inter-agency coordination which, in turn, leads to lack of effective intelligence monitoring and security response.
- States are often reluctant to share information on the platform.
- There are several gaps in sharing critical information at the right time.
- Plans are afoot for more than a decade to link the system up to the district level.
- Co-ordination and tasking in need of improvement amongst intelligence agencies and between state and Central agencies
- Intelligence collection is ad-hoc in the absence of clear-cut requirements from the consumers of intelligence
- Poor cadre management and inability to recruit qualified language specialists and technical skills result in a shortage of personnel
- Lack of intellectual capacity and investment in education system exacerbate recruitment shortfalls in intelligence agencies. Engaging private players for specialist tasks is therefore necessary.
Agencies suffer from chronic shortage of military expertise. Big data analytics capabilities need to be commissioned and customised for the Indian context.

Special forces capabilities need to be ramped up and their concept of use ‘married’ with the capabilities of intelligence agencies.

China’s growth and the multiplication of its capabilities requires a more focused effort in TECHINT (Technical Intelligence) and HUMINT (Human Intelligence).

There has been, over the years, a duplication of resources and capabilities, mainly because of ineffective coordination.

The R&AW and the Aviation Research Centre (ARC) both are gathering electronic intelligence on China albeit on different platforms.

The NTRO is now designated as the nodal agency for technical intelligence, but it is yet to gain control of all or acquire assets for other.

Lack of political attention and effective guidance has prevented reform and optimal functioning of the intelligence system.

Way forward

To improve the level of coordination, inter-operability amongst the agencies must be enhanced.

There exists a necessity to co-opt the private sector in intelligence work to make up for the shortfall.

Political attention and leadership which is attuned to the security needs of the country, as well as possessing a nuanced understanding of the ways of bureaucracy.

While there exists a necessity to create additional capabilities, duplication of assets and capabilities must be rationalised given the economic costs.

Terrorism has moved beyond the physical space to the digital space. In this context, the gathering of intelligence needs to become multi-faceted as well.

India should build robust systems to ensure uninterrupted and safe operations of the country’s digital infrastructure.

There is a need for one agency to focus on open source information and internet-based communications which will cover all mediums, including newspapers, radio, the internet and social media sites like Twitter and Facebook.

Collaboration between government, media and public to raise awareness about anti-terrorism.

Conclusion

It is imperative that intelligence agencies and the armed forces develop the capacity to deal with unpredictable threats. This calls for urgent and comprehensive reform and restructuring of the intelligence apparatus. The initiative must come from the political leadership committed to secure the country’s strategic interests in the face of phenomenal and often unexpected challenges.
India needs to formulate an all-encompassing national vision for defence forces to enable coherence in multi-sectoral and multi-ministerial policymaking and execution. Examine. (250 words)

Difficulty level: Moderate
Reference: The Hindu

Why the question:
India where piecemeal announcements are made in various sectors without a stated national vision. There is no overarching official document to guide policy and decision-making.

Key Demand of the question:
To write the need for national vision for defence forces.

Directive word:
Examine – When asked to ‘Examine’, we must investigate the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications.

Structure of the answer:
Introduction:
Begin by giving context that India lacks a coherent national vision pertaining to its defence forces.

Body:
First, mention the impact of the lack of a national vision – reactive approach, lack of modernisation, limited coordination, inefficient utilisation of funds etc;
Next, discuss the benefits of having a nation vision for better coherence in multi-sectoral and multi-ministerial policymaking and execution and the steps that are needed in this regard.

Conclusion:
Conclude with a way forward to address these issues.

Introduction
In India, announcements are made in various sectors without a stated national vision. There is no official document to guide policy and decision-making. The fact that every military emergency, like Kargil or Pulwama, has resulted in emergency arms purchase shows that there is a lack of national vision. There is a need of formulating a comprehensive and coherent multi-sectoral and multi-ministerial policymaking.

Body

Rationale behind creating a national vision for defence forces

• National security concepts have, in the two decades of the 21st century, undergone fundamental changes.

• Porous international boundaries, growing terror threats, increasing insurgency within country demand government to envisage and formulate a National Security Doctrine for India.

• The existence of such a document will dissuade adventurism and will reassure our citizens that appropriate measures are in place to protect us.

• Many of India’s national security inadequacies stem from the absence of a national security/defence vision.

• It will not only become the basis for strategy-formulation, contingency-planning and evolution of SOPs, but also send a reassuring message to our public.

• It is necessary in the face of having nuclear-armed neighbours, Pakistan and China.
To define India’s role in the world and its commitment to protecting the life, liberty and interests of its people.

The country should have an overall national security document from which the various agencies and the arms of the armed forces draw their mandate and create their own respective and joint doctrines which would then translate into operational doctrines for tactical engagement.

In the absence of this, as is the case in India today, national strategy is broadly a function of ad-hocism and personal preferences.

Probable challenges in creating a national security vision

- There is a skewed national security decision-making structure that is driven more by idealism and altruism, rather than by realpolitik imperatives.
- National security has suffered neglect for decades due to pre-occupation of our politicians with electoral politics.
- Defining national interests in a multi-party democracy like India that has representation across the ideological spectrum has been hard to achieve.
- Decisions of national security are taken in individual silos rather than cross-domain exchange as subjects are inter-related.
- There is opacity in the functioning of Intelligence agencies for instance there is no credible external audit that happens.
- The agencies that are to provide security cover and neutralise terrorist threats do not have a cohesive command and control structure.
- There has been a gap in political pronouncements in our military capabilities — material as well as organisational.

Way forward

- 5 key areas in draft National Security Policy that Shyam Saran, former chairman of the National Security Advisory Board (NSAB), has prepared and handed over to the government in January 2015: Domestic security, External security, Military preparedness, Economic security and Ecological security.
- “Strategic communication” is of overarching importance in National Security which must be improved. A command control and communication centre must be built.
- The NSD should guide various doctrines related to external and internal security to fill a huge void in the higher defence management of the country.
- The policy must go much beyond issues of national security and encapsulate the domain of constitutional rights as well.
- It must take an all-inclusive approach to national security integrating diplomatic engagement, domestic economic discipline and amity among communities at home with military power.
• We need to tailor our strategic defence doctrine to create long-term measures towards a deterrent based on severe retribution.

• Emerging strategic technologies like Artificial Intelligence, robotics and miniaturised wars are likely to play an increasingly important role in future warfare, this must be taken care of.