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POLITY AND GOVERNANCE

ERA OF COALITION POLITICS IN INDIA

Why in the News?

In the recent Lok Sabha election verdict, the BJP did not achieve the majority mark of 272 seats independently and will require the backing of coalition allies, such as Chandrababu Naidu's TDP and Nitish Kumar's JD(U), to establish a government. This development signifies a shift back to coalition governance after two consecutive terms of a BJP-majority administration.

HISTORY OF COALITION POLITICS IN INDIA

Coalition politics in India began gaining prominence in the late 20th century. Prior to this, Indian politics was dominated by the Indian National Congress (INC), which enjoyed a near-monopoly on political power in the initial decades post-independence. However, the political landscape began to fragment, especially from the 1970s onward, leading to the rise of multiple regional parties and the decline of single-party dominance.

Key Phases of Coalition Politics

- **1977-1980: The Janata Party Experiment**
    - The Emergency period (1975-1977) imposed by then Prime Minister Indira Gandhi led to widespread discontent. In the 1977 elections, a coalition of opposition parties, including the Janata Party, came to power, marking India's first significant coalition government. However, internal conflicts led to its collapse within three years.
- **1989-1991: The National Front Government**
    - The National Front, led by V.P. Singh formed the government with outside support from the BJP and the Left Front. This period saw the Mandal Commission report's implementation, leading to social upheaval and eventually the fall of the government.
- **1996-1998: United Front Governments**
    - After the 1996 elections, no single party secured a clear majority. A coalition government led by the United Front (an alliance of several regional parties) was formed with support from the Congress. This phase witnessed two short-lived governments under Prime Ministers, H.D. Deve Gowda and I.K. Gujral.
- **1998-2004: The Rise of NDA**
    - The Bharatiya Janata Party (BJP) emerged as a significant player in coalition politics, leading the National Democratic Alliance (NDA). Atal Bihari Vajpayee's leadership saw the NDA forming the government, which lasted until 2004. The NDA's tenure was marked by economic reforms and significant developments in India's nuclear policy.
- **2004-2014: UPA Era**
    - The United Progressive Alliance (UPA), led by the Congress, came to power in 2004 with Manmohan Singh as Prime Minister. The UPA remained in power for two terms, focusing on economic growth and social welfare programs. The coalition included several regional parties, which were crucial for its stability.

MAJOR CHALLENGES WITH COALITION POLITICS

1. Policy Coordination and Consensus Building

- **Diverse Ideologies:** Coalition partners often have different ideologies and policy priorities, making it difficult to reach a consensus on key issues.
- **Conflicting Interests:** Balancing the varying interests of coalition partners can lead to compromises that may dilute the effectiveness of policies.

2. Government Stability

- **Frequent Threats of Withdrawal:** Smaller coalition partners may threaten to withdraw support to extract concessions, leading to instability.
- **Short-term Focus:** The need to constantly negotiate and appease partners can result in a short-term focus on governance, with long-term policies being sidelined.

3. Decision-making Delays

- **Prolonged Negotiations:** Reaching agreement on policy decisions can be time-consuming, leading to delays in implementation.
- **Bureaucratic Slowdown:** The necessity of obtaining multiple approvals from coalition partners can slow down the bureaucratic process.

4. Administrative Inefficiency

- **Fragmented Governance:** Different coalition partners may control different ministries, leading to a lack of cohesive governance and inter-ministerial coordination.
- **Overlapping Authorities:** Disagreements over jurisdiction and authority can lead to inefficiencies and conflicting directives within the government.

5. Resource Allocation

- **Unequal Distribution:** Coalition partners may demand disproportionate resources for their regions or constituencies, leading to uneven development.
- **Fiscal Strain:** The need to fulfil various coalition partners' demands can strain the government's fiscal resources.

6. Public Perception and Legitimacy

- **Perceived Instability:** Frequent conflicts and compromises within the coalition can lead to a perception of instability and ineffectiveness among the public.

- **Trust Deficit:** Public trust in the government may erode if coalition conflicts lead to policy paralysis or frequent changes in governance.

7. Corruption and Patronage

- **Increased Corruption Risks:** The need to keep coalition partners happy can lead to increased patronage and corruption as favours are exchanged for support.
- **Patronage Networks:** Coalition politics can foster patronage networks where government resources are distributed based on political loyalty rather than merit or need.

8. Implementation Challenges

- **Policy Reversals:** Policies may be reversed or altered frequently due to changing coalition dynamics, leading to implementation challenges and uncertainty.
- **Inconsistent Policies:** Inconsistent policies can result from balancing diverse coalition demands, affecting long-term planning and development.

ROLE OF COALITION POLITICS IN STRENGTHENING DEMOCRACY

1. Diverse RepresentationDiverse Voices: Coalition governments bring together various political parties representing different regions, communities, and interest groups. This inclusivity ensures that a wider array of voices and opinions are considered in the decision-making process.

2. Accountability

- **Power Sharing:** Coalition governments distribute power among various parties, preventing any single party from dominating. This power-sharing mechanism acts as a check against authoritarianism and promotes balanced governance.
- **Accountability:** With multiple parties involved, coalition partners can hold each other accountable, reducing the risk of unilateral decisions and promoting transparency.

3. Consensus Building

- **Negotiated Policies:** Coalition politics necessitates negotiation and compromise, leading to more balanced and well-thought-out policies. This process can result in more sustainable and broadly accepted solutions.

4. Policy Continuity

- **Policy Continuity:** Coalition governments often ensure continuity of policies, especially when coalition partners span different electoral cycles. This continuity can contribute to long-term planning and stability.

5. Promotion of Decentralisation

- **Empowering Regions:** Coalition governments often include regional parties, which can lead to greater attention to regional issues and more balanced federalism.
- **Decentralization:** The involvement of regional parties in national governance can promote decentralization, empowering local governments and leading to more localized decision-making.

6. Preventing Majoritarianism

- **Protecting Minorities:** Coalition politics helps prevent the tyranny of the majority by ensuring that minority interests are taken into account, thus protecting minority rights and fostering social harmony.

While coalition politics has many challenges, it also offers significant opportunities to strengthen democracy. By promoting inclusivity, accountability, decentralisation, and innovation, coalition governments can lead to more representative, stable, and effective governance. The key to leveraging the benefits of coalition politics lies in fostering a political culture of cooperation, respect for diverse viewpoints, and commitment to democratic principles.

DEMAND FOR SPECIAL CATEGORY STATUS

Why in The News?

In the recent Lok Sabha election verdict, the BJP did not achieve the majority mark of 272 seats independently and will require the backing of coalition allies, such as TDP and JD(U), to establish a government. Bihar and Andhra Pradesh are demanding Special Category Status (SCS) from the central government in a negotiation deal to support the BJP government.

ABOUT SPECIAL CATEGORY STATUS

Special Category Status (SCS) in India is a classification given to certain states based on criteria set by the Finance Commission. This status aims to provide additional financial assistance to states facing significant economic and geographical challenges. The Special Category Status was introduced by the Fifth Finance Commission of India in 1969, and it has been a subject of extensive debate and policy formulation since then.

BENEFITS OF SPECIAL CATEGORY STATUS

1. Financial Assistance

- Higher Grants: States with SCS receive a higher proportion of grants compared to loans in centrally sponsored schemes. Typically, they receive 90% grants and 10% loans, while other states receive 70% grants and 30% loans.

2. Tax Benefits

- Tax incentives: SCS states enjoy tax breaks and exemptions, which can attract industries and investments. These concessions can include exemptions from excise duty and customs duty.

3. Preferential Treatment in Central Schemes

- Preferential Funding: States with SCS receive preferential treatment in allocating funds for central government schemes and projects. This helps ensure that these states get adequate resources for development.

4. Infrastructure Development

- Additional Support for Infrastructure Projects: SCS states often receive enhanced support for infrastructure projects such as roads, railways, and power. This can help overcome geographical and logistical challenges.

5. Investment Incentives

- Attracting Investment: The financial and tax incentives provided to SCS states can attract both domestic and international investments, leading to industrial growth and job creation.

6. Social Sector Improvements

- Enhanced Funding for Social Sectors: Additional central funds can be directed towards improving education, healthcare, and other social sectors, leading to better human development indicators.

7. Economic Stability

- Fiscal Support: SCS states often have weaker economic bases and higher fiscal deficits. The additional financial support helps maintain fiscal stability and enables these states to invest in development projects.

8. Disaster Relief

- Priority in Disaster Relief Funds: SCS states receive priority in allocating funds for disaster relief and management, which is crucial for states prone to natural disasters.

ELIGIBILITY CRITERIA TO GET SPECIAL STATUS

- Hilly and difficult terrain
- Low population density or a large share of the tribal population
- Strategic location along borders with neighbouring countries
- Economic and infrastructural backwardness
- The non-viable nature of state finances

STATES THAT ARE GETTING THE BENEFITS UNDER SPECIAL STATUS

Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir (now a UnionTerritory), Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Uttarakhand

WHY IS BIHAR DEMANDING SPECIAL STATUS?

- Bihar has a high poverty rate, with nearly one-third of its population living in poverty, as revealed by the "Bihar Caste-based Survey, 2022.
- Bihar's per capita net state domestic product for 2022-23 was among the lowest in the country, at ₹31,280.
- Bihar argues that it faces challenges similar to those of other states that have been granted SCS, such as hilly terrain, low population density, and economic backwardness, but has not received the same support.
- Bihar has been demanding SCS since its bifurcation in 2000, citing the need for special assistance to address its economic and infrastructural challenges.

WHY IS ANDHRA PRADESH DEMANDING SPECIAL STATUS?

- When Andhra Pradesh was bifurcated in 2014, then Prime Minister Manmohan Singh promised SCS to the

residual state for a period of five years to address its economic disadvantages.

- Chandrababu Naidu's Telugu Desam Party (TDP) has consistently demanded SCS for Andhra Pradesh, citing the state's economic challenges and special assistance.
- Large parts of Telangana are drought-prone, impacting agriculture and water availability. Special status would bring in more funds for irrigation and water management projects, addressing these challenges more effectively.
- Special status typically comes with tax breaks and incentives, which can attract industries and investments to the state. This would lead to job creation and economic growth.

DRAWBACKS OF GRANTING SPECIAL CATEGORY STATUS TO DIFFERENT STATES:

- Increased Financial burden on central government: Granting SCS to more states increases the financial burden on the central government, as it has to provide higher grants and financial assistance. This can strain the central budget and impact fiscal discipline.
- Over-dependence on central funds: States with SCS may become overly dependent on central assistance and might not strive as hard to generate their own revenues or improve their financial management. This could hinder long-term sustainable development.
- Less funds available for General states: Allocating significant resources to SCS states may reduce the funds available for non-SCS states, potentially affecting their development and growth prospects. This could exacerbate regional disparities.
- Domino effect: Granting SCS to more states can lead to a proliferation of demands from other states, each arguing their case for special status. This can complicate the decision-making process and create administrative and financial challenges for the central government.
- Political lobbying: The process of granting SCS can become politicised, with states lobbying for special status based on political considerations rather than genuine needs. This could lead to a misuse of the system and allocation of resources based on political expediency rather than objective criteria.

WAY FORWARD

- Development Index: Raghuram Rajan proposed creating a composite development index that objectively assesses each state's development needs. This index would consider per capita income, poverty rate, education levels, and health indicators.
- Tailored Financial Assistance: Rather than a blanket SCS, financial assistance should be tailored to each state's specific needs and challenges. This approach would ensure that funds are used more effectively and address each state's unique issues.
- Project-Based Funding: Central assistance should be linked to specific developmental projects rather than general budgetary support. This would ensure better accountability and targeted use of funds for impactful projects.
- Performance-Based Incentives: States should be incentivised based on their performance in implementing developmental programs and achieving outcomes. This approach promotes healthy competition among states to improve their governance and development metrics.

PRELIMS QUESTION

Q1. Consider the following statements regarding Special category status:

1. The concept of Special Category Status was introduced by the Fifth Finance Commission of India.
2. Low sex ratio and high population density are some criteria for granting special status.

Choose the correct answer using the codes given below:

(a) 1 Only

(b) 2 Only

(c) Both 1 and 2

(d) Neither 1 nor 2

ANSWERS

S. No.	Answers
1.	A

MAINS QUESTION

Q1. Discuss the historical context and primary objectives behind the introduction of Special Category Status (SCS) in India. How has this status evolved over time?

Q2. Discuss the role of coalition politics in ensuring government stability. How do frequent threats of withdrawal by coalition partners impact long-term governance and policy implementation?

SCIENCE AND TECHNOLOGY

ISRO DEVELOPS PRAVAHA SOFTWARE

Why in the News?

The Indian Space Research Organisation has developed a Computational Fluid Dynamics (CFD) software called **Parallel RANS Solver for Aerospace Vehicle Aero-thermo-dynamic Analysis, also known as PraVaHa.**

Developed at ISRO's Vikram Sarabhai Space Centre (VSSC), PraVaHa simulates external and internal flows on various launch vehicles, including winged and non-winged re-entry vehicles. It is capable of precisely predicting complex aerodynamic flows and aerothermal loads, making it an ideal tool for designing and characterising aerospace vehicles.

ABOUT COMPUTATIONAL FLUID DYNAMICS (CFD) SOFTWARE

Computational Fluid Dynamics (CFD) software is a specialized tool used for simulating fluid flow, heat transfer, and related phenomena. This software is critical in various fields, including aerospace, automotive, civil engineering, and energy.

KEY BENEFITS OF CFD SOFTWARE

- **Accurate Predictions:** CFD software can model complex fluid behaviours, providing detailed insights into flow patterns, heat transfer, and chemical reactions.
- **Cost-Effective:** CFD software reduces the need for physical prototypes and experiments, saving time and resources.
- **Optimization:** Helps in optimizing designs by allowing for the evaluation of multiple configurations and scenarios.
- **Safety:** Enhances safety by predicting potential issues and mitigating risks in the design phase.
- **Multiphysics Capabilities:** Integrates fluid dynamics with other physical phenomena, offering comprehensive analysis for complex engineering problems.

MAJOR BENEFITS OF PRAVAHA

- **Accurate Prediction Capability:** PraVaHa excels in precisely predicting complex aerodynamic flows and aerothermal loads, which is essential for designing and characterizing aerospace vehicles.
- **Faster Simulation Turnaround Time: The software can rapidly perform simulations on high-performance computing clusters, enabling the evaluation of multiple configurations and aiding** in selecting optimal designs.
- **Flexibility and Collaborative Development:** Designed to leverage both CPU and GPU architectures, PraVaHa is adaptable for collaborative projects with academic institutions and government laboratories.
- **Simulation of Various Conditions:** The software can simulate airflow under both perfect gas and real gas conditions. It is also validated for simulating chemical reactions during Earth re-entry and combustion in scramjet vehicles.
- **Replacement of Commercial Software:** PraVaHa aims to replace many commercial CFD software applications currently used for aerodynamic characterization, offering a cost-effective, indigenous solution for aerospace design.
- **Support for Academia and Industry:** By making PraVaHa available to academic institutions and other entities, ISRO supports the design of missiles, aircraft, and rockets, fostering self-reliance in India.
- **Enhanced Thermal Protection System Design:** The software aids in designing the shape, structure, and thermal protection systems necessary for aerospace vehicles during launch and re-entry, ensuring crew and vehicle safety.
- **Improved Aerodynamic Analysis:** PraVaHa can simulate both external and internal flows on launch vehicles and re-entry vehicles, whether winged or non-winged, allowing for comprehensive aerodynamic and aerothermal load analysis.
- **Reduced Simulation Time:** Its ability to quickly simulate complex aerodynamic flows reduces the time required for simulation and analysis, making design and testing processes more efficient.
- **Support for Human Spaceflight Missions:** PraVaHa is extensively used in the Gaganyaan program for aerodynamic analysis of human-rated launch vehicles, crew escape systems, and crew modules, making it an essential tool for future human spaceflight missions.

HOW WILL PRAVAHA CONTRIBUTE TO THE SUCCESS OF THE HUMAN SPACEFLIGHT MISSION?

- **Aerodynamic Analysis of Launch Vehicles and Crew**

Modules: PraVaHa is extensively utilized in the Gaganyaan program to analyze the aerodynamics of human-rated launch vehicles, crew escape systems, and crew modules, ensuring spacecraft safety and stability during launch, ascent, and re-entry.

- **Thermal Protection System Design:** The software aids in designing the shape, structure, and thermal protection systems necessary for aerospace vehicles during launch and re-entry, safeguarding both the crew and the vehicle.
- **Simulation of Complex Aerodynamic Flows:** PraVaHa can accurately predict complex aerodynamic flows and aerothermal loads, making it an essential tool for designing and characterizing the Gaganyaan spacecraft.
- **Faster Simulation Turnaround:** PraVaHa can perform rapid simulations on high-performance computing clusters, allowing for the evaluation of multiple configurations and the selection of optimal designs for the Gaganyaan mission.
- **Replacement of Commercial Software:** PraVaHa offers a cost-effective, indigenous solution for the Gaganyaan program, expected to replace most commercial CFD software currently used for aerodynamic characterization.

FUTURE SPACE DEVELOPMENTAL PROGRAMMES OF ISRO

Gaganyaan Mission:

- **Human Spaceflight:** ISRO's Gaganyaan mission aims to send Indian astronauts into space. The mission includes developing human-rated launch vehicles, crew modules, and life support systems. The first crewed mission is planned for the near future, following the successful completion of uncrewed test missions.

Chandrayaan-3:

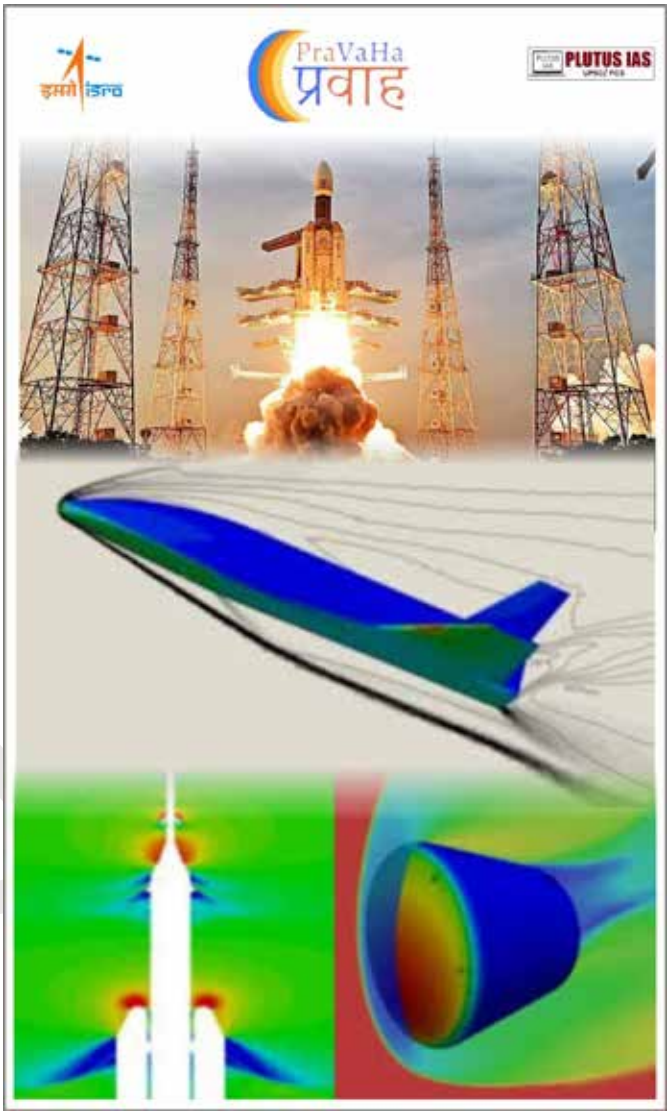
- **Lunar Exploration:** Following the success of Chandrayaan-2, ISRO is planning Chandrayaan-3, which will include a lander and a rover to explore the lunar surface further, particularly focusing on the south pole region of the Moon.

Aditya-L1 Mission:

- **Solar Observation: T**he Aditya-L1 mission aims to study the Sun's corona and its impact on space weather. The mission will place a satellite in a halo orbit around the L1 point of the Sun-Earth system.

Mangalyaan-2 (Mars Orbiter Mission 2):

- **Mars Exploration:** Building on the success of the first Mars Orbiter Mission (Mangalyaan), ISRO plans to launch a second mission to Mars to explore the Martian atmosphere and surface further.



Reusable Launch Vehicle (RLV):

- **Cost-Effective Access to Space:** ISRO is developing an RLV technology to reduce the cost of access to space. This involves designing a vehicle that can return to Earth and be reused for multiple missions.

Small Satellite Launch Vehicle (SSLV):

- **Commercial Launch Services:** The SSLV is being developed to cater to the growing small satellite market. It will provide on-demand launch services for small satellites, offering a cost-effective and flexible launch solution.

Space Station:

- **Orbital Habitat:** ISRO has plans to develop its own space station. This long-term project aims to support

scientific research and serve as a platform for international collaboration in space.

Next-Generation Launch Vehicles:

- **Advanced Rocket Technologies:** ISRO is developing more advanced launch vehicles, including the Unified Launch Vehicle (ULV) and heavy-lift rockets, to increase payload capacities and improve mission versatility.

Satellite Constellations:

- **Communication and Earth Observation:** ISRO plans to deploy constellations of satellites for enhanced communication services, global internet coverage, and comprehensive Earth observation capabilities.

CRASH OF THE SUKHOI FIGHTER JET"

WHY IN THE NEWS?

A recent incident occurred where an SU-30MKI fighter jet of the Indian Air Force (IAF) met with an accident in Nashik. The aircraft, which had undergone recent maintenance and overhaul by Hindustan Aeronautics Limited (HAL), was conducting a test flight from HAL Nashik at Sirsa Gaon when the unfortunate incident took place.

ABOUT SUKHOI :

- **Variants**: The Sukhoi Su-30 family includes several variants, such as the Su-30MKI, Su-30MKM, and Su-30MKA, each designed for specific requirements and users.
- **Design and Development:** It was designed to be a multirole fighter for all-weather, air-to-air, and air interdiction missions.
- **Performance**: The Sukhoi Su-30 is known for its exceptional agility, speed, and manoeuvrability. It can fly at speeds over Mach 2 (twice the speed of sound) and has a service ceiling above 59,000 feet (18,000 meters).
- **Armament**: The Su-30 can carry a range of weapons, including radar-guided and infrared-homing air-to-air missiles, unguided air-to-ground rockets, conventional bombs, cluster bombs, and a 30-mm gun.
- **Electronic Warfare**: The Su-30MKI, in particular, has enhanced electronic warfare capabilities, including a modern AESA radar, a High Band Jammer Pod (HBT), Dhruti Radar Warning System, and a Dual Color Missile Approach Warning System.
- **Production and Deployment**: India has acquired and produced the Su-30MKI under license from Russia. The Indian Air Force (IAF) has nearly 260 Su-30MKIs in its inventory as of January 2020.
- **Upgrade Program:** The IAF's Su-30MKI fleet is set to undergo a comprehensive upgrade worth ₹60,000 crore (approximately $8.3 billion USD). The upgrade includes new radars, mission control systems, electronic warfare capabilities, and integration of new weapon systems.

KEY FEATURES OF THE NEW INDIGENOUS RADAR FOR THE SUKHOI SU-30MKI ARE:

- **High Resolution and Accuracy**: The **Virupaksha radar** is designed to detect and track targets with high resolution and accuracy, enhancing its capabilities for air-to-air and air-to-ground engagements.
- **Long-Range Detection**: The radar is primarily designed for long-range detection and tracking, which is crucial for the Su-30MKI's multirole capabilities.
- **Multi-Mode Radar:** The Virupaksha radar is capable of tracking multiple targets simultaneously, which increases its effectiveness in various combat scenarios.
- **Indigenous Development**: The radar is developed in-

digenously by the Indian Defense Research and Development Organization (DRDO), reflecting India's commitment to self-reliance in defence manufacturing.

- **Enhanced Target Detection and Engagement**: The radar is designed to enhance target detection and engagement capabilities, which will significantly improve the Su-30MKI's air-to-air and air-to-ground targeting capabilities.
- **Integration with Other Systems**: The Virupaksha radar will be integrated with other advanced systems, including electronic warfare systems and infrared search and track systems, to provide a comprehensive upgrade to the Su-30MKI.

THE SUKHOI SUPERJET 100'S AVIONICS SUITE INCLUDES SEVERAL SAFETY FEATURES :

- **Enhanced Ground Proximity Warning System (EGPWS)**: It provides warnings to the pilots in case of a potential ground collision, ensuring a safe distance from the ground during landing.
- **Enhanced Traffic Collision Avoidance System (ETCAS)**: This system helps prevent collisions with other aircraft by providing warnings and alerts to the pilots in case of a potential collision.
- **Autopilot**: The Sukhoi Superjet 100 is equipped with an advanced autopilot system and automatically adjust the aircraft's flight path to maintain a safe distance from other aircraft and obstacles.
- **Electronic Flight Bag (EFB)**: The EFB is an electronic version of the traditional flight bag, providing pilots with real-time information and tools to manage the flight safely.
- **Advanced Avionics Suite**: The Sukhoi Superjet 100 features a state-of-the-art avionics suite that includes multiple layers of redundancy to ensure the aircraft can maintain control in case of a system failure.
- **Fly-by-Wire System**: The Sukhoi Superjet 100 has a fly-by-wire system that eliminates the need for manual control and allows the aircraft to adjust its flight path automatically to maintain a safe distance from other aircraft and obstacles.
- **Emergency Oxygen System**: The aircraft is equipped with an emergency oxygen system that provides a safe supply of oxygen to the pilots in case of an emergency.
- **Emergency Descent System**: The Sukhoi Superjet 100 has an emergency descent system that can quickly and safely descend the aircraft to a lower altitude in case of an emergency.
- **Stall Warning System:** The aircraft is equipped with a warning system that alerts the pilots if the aircraft is approaching a stall, ensuring a safe and controlled flight.
- **Centralized Maintenance System (CMS)**: The Sukhoi Superjet 100 is equipped with a CMS that records and analyses maintenance data, swiftly diagnosing any faults and reducing downtime and costs.

THE SAFETY MEASURES IN PLACE FOR SUKHOI TEST FLIGHTS INCLUDE:

- **Pre-flight Checks**: Before each test flight, the aircraft undergoes thorough checks to ensure that all systems are functioning properly. This includes checks on the engines, avionics, and other critical systems.
- **Pilot Training**: Pilots undergo rigorous training to ensure they are proficient in handling the aircraft and responding to emergency situations. They are also trained to identify and report any technical issues during the flight.
- **Technical Snag Reporting**: Pilots are trained to report any technical issues or snags during the flight. In the recent incident, the pilots reported a technical snag before ejecting safely.
- **Emergency Procedure**: The aircraft is equipped with emergency procedures and systems, such as emergency oxygen, emergency descent, and stall warning systems, to ensure the safety of the pilots and passengers.
- **Regular Maintenance**: The aircraft undergoes regular maintenance and overhaul procedures to ensure that all systems are functioning properly. In the recent incident, the aircraft was being tested after an overhaul.
- **Investigation**: After any incident, a detailed investigation is conducted to identify the cause and prevent similar incidents in the future.

WAY FORWARD:

- **Enhanced Pilot Training**: Pilots should undergo rigorous training to handle emergency situations and develop quick reflexes to prevent disasters during landing.
- **Advanced Avionics and Automation**: Modern fighter jets should be equipped with advanced avionics and automation systems that can assist pilots in emergency situations and help prevent crashes.
- **Regular Maintenance and Overhaul**: Regular maintenance and overhaul procedures should be

followed to ensure that all systems are functioning properly, reducing the likelihood of technical snags.

- **Stealth Technology**: Stealth technology can help reduce the radar cross-section of fighter jets, making them less detectable and reducing the risk of crashes during landing.
- **Quieter Engines**: Quieter engines can reduce noise levels and risk of hearing damage for aircrews and people living near airbases.
- **Improved Safety Features**: Fighter jets should be equipped with advanced safety such as enhanced ground proximity warning systems, electronic flight bags, and emergency oxygen systems to ensure the safety of pilots and passengers.
- **Investigation and Analysis**: Detailed investigations to prevent similar incidents in the future and identify the root cause.
- **Advanced Materials and Design**: With advanced materials and design techniques can help reduce the weight and improve the aerodynamics of fighter jets, making them more maneuverable and reducing the risk of crashes.
- **Enhanced Communication**: Improved communication between pilots, ground control, and other aircraft can help prevent misunderstandings and reduce the risk of crashes during landing.
- **Continuous Upgrades and Improvements**: Fighter jets should be continuously upgraded and improved with the latest technology and safety features to ensure they remain safe and effective.

- **Replacement of old jets with Indigenous Fighter jets:** Old Fighter must be replaced at a fast pace to reduce the casualty of the officers. By collaboration with foreign players, Indigenously production of new generation to enhance combat operations and strikes.

PRELIMS QUESTION

Q1. Recently seen in the news, "PraVaHa" is related to:

(a) PraVaHa is designed exclusively for marine engineering applications, focusing solely on simulating underwater fluid dynamics.
(b) PraVaHa software was developed by a private space company for a space simulation programme.
(c) The Ministry of Jal Shakti launched the PraVaHa scheme to ensure a round-the-clock water supply for every household.
(d) PraVaHa is a Computational Fluid Dynamics software developed by ISRO.

Q. Consider the following statements with respect to the Tejas fighter Jet:

1. Tejas is an Indian 5th-generation double-engine fighter jet.
2. It is a Hypersonic combat aircraft.

Which of the following statement/s is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

ANSWERS

S. No.	Answers
1.	D
2.	D

MAINS QUESTION

Q1. Discuss the key benefits of Computational Fluid Dynamics (CFD) software developed by ISRO and explain how PraVaHa exemplifies these advantages in aerospace applications and human space flight programmes.

Q2. How can India go from the World's largest defence importer to the exporter and become self-reliant in the defence sector? Analyse

ECONOMY

IMPACT OF INEQUALITY ON GROWTH"

WHY IN THE NEWS?

Many voices contend that inequality poses a threat to democratic processes. On the contrary, some argue that a certain degree of inequality serves as a catalyst for entrepreneurship, stimulating business creation and thereby enhancing employment opportunities and overall welfare. However, this perspective overlooks the adverse economic repercussions of inequality. One significant aspect is the concentration of monopoly power within capital compared to labor, which can detrimentally impact consumption, welfare, and economic growth. Implementing equitable wealth taxation and distribution measures, if executed effectively, can yield positive economic outcomes.

HOW MONOPOLY REDUCES INVESTMENT AND CONSUMPTION:

- Billionaires amass their wealth through monopolistic control in their respective markets. Their conglomerates hold dominant positions, enabling them to dictate prices rather than being subject to market forces.
- The degree of mark-ups above production costs is dictated by their monopoly influence. Consequently, in economies with entrenched monopolies, real wages—determinants of purchasing power—tend to be depressed.
- These effects of monopoly are currently manifesting in the form of cost-of-living crises in developed economies. The phenomenon termed **"greedflation,"** wherein companies hike prices to bolster profit margins amidst multiple demand-and-supply shocks triggered by the pandemic, has been identified as a contributor to high inflation rates in the West.
- Economic theory illustrates that under a monopoly, the profit-maximising output level is lower than in a competitive market, implying a loss in welfare. Thus, the prevalence of monopolies can lead to reduced real wages, diminished output levels, and lower levels of investment.

RELATION BETWEEN INEQUALITY AND GROWTH:

- Consider a scenario where a company opts to establish a new factory. Before the new capital stock is realised, wages are disbursed to labourers for construction.
- The income earned by workers is then spent on goods, thereby augmenting the income of goods-sellers, who in turn increase their spending on other goods, perpetuating a cycle. This process, known as the **'multiplier' effect**, results in an overall increase in incomes greater than the initial investment.
- However, when firms wield market power, mark-ups and prices tend to be inflated. Consequently, real wages decrease, leading to reduced purchasing power.
- While companies enjoy higher profits due to inflated margins, the increase in income resulting from a given investment is lesser under a monopoly due to reduced consumption power. Consequently, **investment's stimulatory effect** on growth is weaker under monopolistic conditions, albeit not affecting profits.
- One could argue that the consumption of the wealthy can fuel economic growth. However, despite their higher absolute consumption, the wealthy apt to allocate a smaller proportion of their incomes towards consumption.
- The multiplier effect hinges on the proportion of income devoted to consumption. In an unequal economy, lesser incomes in the hands of those with a higher propensity to consume lead to a weakened expansion in the economy.

RELATION BETWEEN THE ACCUMULATION OF WEALTH AND INVESTMENT:

- Some contend that the remedy of redistribution may prove more detrimental than the ailment of inequality by stifling job creation.

- High-tax regimes may dampen entrepreneurs' incentives to amass wealth, leading to decreased investment and job opportunities. However, a distinction must be drawn between wealth and profits.
- Investment decisions are guided by expectations of future profits, whereas wealth accumulates from past profits. Taxes on wealth, as argued by economist Michal Kalecki, do not necessarily impact investment since they leave profit expectations unchanged.
- For instance, taxing Gautam Adani's wealth would not directly affect investment in airports, as the demand for air travel remains independent of his wealth's value.

Undoubtedly, the difficulty in converting profits into wealth may dissuade some business owners from undertaking investment. Nevertheless, an economy with high-profit expectations would incentivise businesses to invest even in the face of wealth taxation. Redistribution can stimulate growth by strengthening the multiplier process through increased income. Businesses are more inclined to invest where purchasing power is robust. Additionally, if monopolies are curbed, prices would decrease, and real wages would rise, leading to heightened demand.

Thomas Piketty's proposal to tax billionaire wealth and provide basic income may lead some individuals to exit the economy. However, it can also foster a new wave of entrepreneurs who are liberated from the necessity of wage labour. Redistribution alone is not a panacea, and excessively high tax rates can become an economic burden. Nonetheless, when employed in conjunction with other policy measures, addressing inequality can pave the way for a more robust economy.

SOME MEASURES NEEDED TO REDUCE INEQUALITY:

- Boosting Employment and Wages:
  - Investing in infrastructure to create job opportunities.
  - Reduce the cavity between labour demand and supply through skill training.
  - Promoting labour-intensive exports and supporting small enterprises.
  - Ensure social security and fair working conditions for all.
- Advancing Human Development:
  - Increasing public expenditure on healthcare and education.
  - Prioritizing initiatives to improve health and education outcomes.
- Establishing Social Safety Nets:**
  - Implementing programs like the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) to enhance livelihood security.
  - Providing accessible and affordable healthcare services through initiatives like the National Health Mission (NHM).
  - Promoting gender equality through campaigns like Beti Bachao Beti Padhao.
- Addressing Urban-Rural Disparities:
  - The Pradhan Mantri Awas Yojana (PMAY) and Swachh Bharat mission focus on providing affordable housing in both urban and rural areas.
  - Bridging the gap in living standards and infrastructure between urban and rural regions.

The aim of these programs is to create a more equitable society in India by providing equal opportunities for all individuals to flourish and contribute to the nation's progress. Initiatives like social welfare schemes, educational programs, healthcare services, and employment generation efforts play a crucial role in reducing inequality and fostering inclusive growth and social harmony in the country.

"OPEC+ OIL PACT DECIDED TO CUT OIL PRODUCTION"

Why in the news?

Brent crude oil prices dipped below $80 per barrel shortly after the group's decision on Sunday to prolong most of their oil output cuts until 2025. However, the agreement also allows for a gradual easing of voluntary cuts by eight members starting in October. This price point is crucial for many OPEC+ members as it aligns with their budget-balancing needs. Currently, OPEC+ members collectively reduce their production by 5.86 million barrels per day (bpd), which roughly corresponds to 5.7% of the global demand for oil.

About OPEC+:

- Established in September 1960 in Baghdad, OPEC (Organization of the Petroleum Exporting Countries) was founded by Iraq, Iran, Kuwait, Saudi Arabia, and Venezuela. It has since grown to encompass 12 member countries, collectively representing approximately 30% of global oil production. With its headquarters situated in Vienna, Austria, OPEC operates primarily in

English.

- The current Secretary General of OPEC is Haitham al-Ghais. OPEC holds considerable sway in the global oil market and international diplomacy, with its decisions often shaping both economic and geopolitical landscapes.
- OPEC+ emerged in 2016 as a response to the downturn in oil prices spurred by increased shale oil production in the United States. Comprising OPEC members and ten other oil-producing nations, including Russia, OPEC+ aims to synchronise petroleum policies among its members.
- The coalition's primary goals are to stabilise prices for producers, ensure a steady supply for consumers, and provide favourable returns on investment in the oil industry.
- Key aspects of OPEC+ include its formation in 2016, which brought together OPEC nations and ten other oil-producing countries to coordinate production and stabilise global oil prices.
- The alliance focuses on securing fair pricing for producers, ensuring a reliable supply for consumers, and fostering profitable investments in the oil sector. Membership in OPEC+ extends beyond OPEC's 13 countries, including non-OPEC nations like Russia, Mexico, and Kazakhstan.
- OPEC+ has implemented various rounds of production cuts to stabilise oil prices, including a reduction of 1.2 million barrels per day in 2023, with these cuts extended into 2025. The alliance's combined production represents a significant portion of global oil output, accounting for approximately 59% in 2022.

REASONS BEHIND OIL PRODUCTION CUT:

- Managing Supply and Supporting Oil Prices: OPEC+ aims to manage supply and support oil prices by reducing production to counterbalance slow demand growth, high interest rates, and the rise in U.S. oil production.
- Uncertain Economic Conditions: The group is waiting for more favourable economic conditions, such as lower interest rates and consistent global economic growth, before altering its production approach.
- Demand Forecast: OPEC anticipates that demand for OPEC+ crude will average 43.65 million barrels per day in the latter half of 2024, which suggests a stock drawdown if output remains at April's rate.
- Voluntary Cuts: The voluntary cuts of 2.2 million barrels per day will be extended by three months, up to the end of September 2024, and then gradually phased out over the year.
- Market Stabilization: The extension of production cuts reflects OPEC+'s commitment to market stabilisation and its strategy to manage supply tightly to support oil prices.
- Global Demand and Inventory Levels: OPEC+ is looking for lower interest rates and more consistent global economic growth to ensure a stable market environment, rather than isolated growth spurts.
- Discrepancy in Demand Forecasts: There is a discrepancy between OPEC's demand forecast and the International Energy Agency (IEA) estimate, highlighting differing perspectives on future market dynamics between oil producers and consumers.
- Saudi Arabia's Leadership: Saudi Arabia has led OPEC+ in cutting production to reduce stocks and boost prices, and there is no sign of a fundamental rethink in the group's strategy.
- Market Conditions: Current market conditions, including inventory levels and prices, suggest that any increase in production is unlikely, and the group may decide to rescind some of last year's output cuts to pre-empt a further rise in production from the United States, Canada, Brazil, and Guyana.
- Long-term Sustainability: There are concerns about the long-term sustainability of OPEC+'s strategy, which prioritises volume over prices, but there is no indication of a significant change in strategy yet.

EFFECTS ON THE INDIAN ECONOMY:

- Increased Imported Inflation: The production cut will drive up crude oil prices, resulting in a rise in India's import bill and exacerbating the current account deficit by approximately 0.4% of GDP. This will further escalate retail prices of petrol and diesel, which are already at historic highs nationwide.
- Diminished Economic Growth: Elevated oil prices will escalate production and transportation costs across various sectors, impacting their profitability and competitiveness. This, in turn, will curtail consumers' disposable income, dampening their demand for goods and services.
- Expanded Fiscal Deficit: The surge in oil prices will elevate the government's subsidy burden, particularly concerning kerosene and liquefied petroleum gas (LPG), where the government subsidises the difference between market and controlled prices. This will widen the fiscal deficit, constraining public spending

on crucial areas like infrastructure and social welfare.

- Heightened External Vulnerability: India's reliance on foreign exchange reserves and external borrowing to finance oil imports will intensify with the surge in oil prices. This heightened dependency exposes India to currency fluctuations and global financial upheavals.
- Impact on Citizens: If the increased crude oil import costs are transferred to the public, it may spur cost-push inflation, affecting every economic facet influenced by oil price movements. Conversely, if state-controlled oil marketing companies absorb the additional costs, it could strain the financial stability of the oil public sector units.
- Exploring Alternatives: India could explore sourcing more affordable crude oil from Russia, although there has been a slight decline in Russia's share in India's oil imports recently. As a long-term strategy, the government should prioritise alternative energy sources and enhance infrastructure, including road networks. Additionally, integrating petroleum products into the goods and services tax framework and promoting energy-efficient vehicle usage or eco-driving practices could mitigate reliance on oil.

INDIA HAS VARIOUS ALTERNATIVE ENERGY SOURCES TO DIMINISH ITS RELIANCE ON OIL IMPORTS:

- Solar Energy: India receives sunlight throughout the year, making solar energy a viable option. Increased investment in solar power plants, rooftop solar panels, and solar farms can significantly contribute to reducing reliance on oil for electricity generation.
- Wind Energy: India has substantial wind resources, especially along its coastline and in certain regions. The expansion of wind farms and investment in wind turbines.
- Hydropower: Utilizing hydroelectric power from rivers and dams can offer a consistent and renewable energy source. India has considerable hydroelectric potential, particularly in states like Himachal Pradesh, Uttarakhand, and Arunachal Pradesh.
- Biomass Energy: India can harness energy from organic sources such as animal waste, agricultural residues, and urban waste through biomass power plants and biogas production.
- Nuclear Energy: Investing in nuclear power plants can provide a more reliable and low-carbon source of electricity. India has been expanding its nuclear energy capacity and can further develop this sector to decrease dependence on oil for power generation.
- Geothermal Energy: Although geothermal resources in India are limited compared to other countries, there is potential for utilising geothermal energy for heating and electricity generation in certain regions with volcanic activity or hot springs.
- Tidal Energy: India's long coastline offers opportunities to generate electricity from tidal energy. Research and development in tidal energy technologies can help harness this renewable resource.
- Hydrogen Energy: Hydrogen is a promising alternative energy source and can reduce dependence on oils and mitigate climate change.

PRELIMS QUESTION

Q1. Consider the following statement regarding inequality prevailing in the country:

1. Redistribution of wealth always leads to reduced inequality and increased GDP.
2. Investment's stimulatory effect on growth is weaker under monopolistic conditions, albeit not affecting profits.

Which of the following statement/s above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Q2. As an OPEC+ member, it decided to cut Oil production:

1. Global oil prices are likely to upsurge drastically.
2. India`s fiscal deficit will reduce .

Which of the following statement/s is/are above correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

ANSWERS

S. No.	Answers
1.	B

2.	D

MAINS QUESTIONS

Q1. Redistribution of wealth is not the panacea to address the inequality that persists in an economy. How can we ensure the reduction of inequality through better redistribution of resources? Discuss.

Q2. Plunged Oil prices cause OPEC+ members to cut Oil Production. How can India reduce its dependency on oil demand? Analyse.