

# CURRENT AFFAIRS

## WEEKLY

**WEEK: 2**

**JUNE  
2021**

### MAINS

GS-I

**COVID-19 and Orphans**

GS-II

**Teesta Dispute and India-Bangladesh Relations**

GS-II

**Why the draconian sedition law must go**

GS-III

**India's GDP fall**

GS-IV

**Ethics of Autonomous Weapon**

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**POLITY & GOVERNANCE**

- RDSO of Indian Railways becomes the first Institution to be declared 'SDO'
- Section 304-B
- 'World No Tobacco Day' 2021
- YUVA - Prime Minister's Scheme for Mentoring Young Authors

**ECONOMY**

- Committee on Variable Capital Company

**ENVIRONMENT**

- Bharat Ratna Professor Rao receives the Eni International Award
- Rise in striped hyena population

**SCIENCE & TECHNOLOGY**

- China's 'artificial sun' experimental fusion reactor set a new record
- Ethics of Autonomous Weapon
- DRDO develops Critical Near Isothermal Forging Technology for aeroengines

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The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

# CURRENT AFFAIRS ANALYST

WEEK- 2 (JUNE, 2021)

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# **SECTION: A**

## **(MAINS)**

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**CURRENT AFFAIRS**

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# COVID-19 & ORPHANS

## CONTEXT

In a latest development, the Supreme Court directed States to nominate a Nodal Officer at level of Secretary/Joint Sec of concerned department to interact with the Amicus Curiae and provide all necessary information relating to identification of orphans/Children in Need of Care and Protection (CNCP) and the schemes enforced.

### ◎ BACKGROUND

- The National Commission for Protection of Child Rights (NCPCR) has informed the Supreme Court that the COVID-19 pandemic has orphaned 1742 children, and 7464 children lost at least one parent during the pandemic.
- The plight of these recently orphaned children has led to increased chatter around 'adoption'.
- But this comes with the threat of child trafficking, often in the form of social media messages calling for direct adoption of children.
- Thus, the SC Bench had directed the district authorities under the Juvenile Justice Act to immediately upload information related to children orphaned due to COVID after March 2020 in the national portal of NCPCR called "Bal Swaraj".

their livelihood resulting in engagement of these orphans in child labor, handicrafts and other menial jobs

- **Loss of Education:** The most important field in which orphans are suffering is Education. Due to stoppage of regular income, orphans are not able to pay their megamouth of school fee resulting in high rate of drop-outs.
- **Psychological Problems:** The death of parents exposes the orphans to various challenges of real life resulting in various psychological problems. It has direct impact on the psyche of children which is depicted by the presence of anxiety, stress, depression and PTSD among orphans.
- **Social Disorganization:** Due to the parental loss, orphans suffered in the field of family, marriage and kinship. With the disorganization of families their socialization got disorganized. There was significant degree of erosion in valuation ethos and social control mechanism within and outside families because in social environment neither the traditional patriarchal authority could be established nor could be the traditional norms legitimized. The marriage of orphan girls is complicated by the demand of dowry.
- **Feeling of Insecurity:** The crucial problem among orphans is feeling of both physical and mental insecurity in absence of senior member in family. This feeling of insecurity can be seen more in women and girls because the situation may invite undesirable things by security forces, thereby posing threat to them.
- **Health Deterioration:** The dangerous problem faced by the orphans is the abnormal health scenario because they are not in a position to get proper treatment or service access in health sector resulting in high mortality rate among them.
- **Total Dependence:** The most undesirable aspect of the life of orphans is their total dependence on others like friends, neighbors, relatives and community members. This dependence can be social, psychological or material in nature. The absence of senior member(s) creates vacuum inside and outside family. Besides psychological implications, the orphans face difficulty in taking initiatives in personal and social matters which affect them for their entire life.

### ◎ ANALYSIS

#### Where Do Orphan Children Come From?

- War, disease, poverty, natural disasters, abandonment, and accidents are among some of the leading causes.
- These can be directly associated with orphans by the definition of a child who has lost one or both parents.
- Within and aside from the aforementioned are: cultural pressures, neglect, abuse, child slavery, religious inequity, child prostitution, indentured servitude and more.
- These are more closely associated with children without parental care that may not be a child that has lost one or more parents.
- They may live with a relative or neighbor or are on the street or in the jungles and subjected to one of the prior mentioned abuses.

#### Issues faced by Orphans

- **Accommodation Problems:** The most serious problem faced by orphans is the problem of shelter. After the death of parents, the orphans are supported by patrikins, matrikins and friends for some time but that support gets stopped afterwards. They have to work outside for earning

- **Deviance:** The deviance and delinquency is common among orphans due to lack of authority, socialization and social control in family. These undesirable trends are unavoidable and such behaviours are expected from the environment in which their growth and development take place.

### Steps taken by Government

- As per the Juvenile Justice (Care and Protection of Children) Act, 2015, orphan and destitute children in the country are "Children in need of care and protection (CNCP)"

### Child Protection Services

- CPS provides preventive, statutory care and rehabilitation services to children who are in need of care and protection and those in conflict with law as defined under the Juvenile Justice (Care and Protection of Children) Act, 2015.
  - ▶ It is a centrally sponsored scheme, providing financial support to State Governments/UT Administrations, for delivering services (as mandated under the JJ Act, 2015 & JJ Rules there under) for children, either themselves or through suitable NGOs.
- **Web portal:** Under the Child Protection Services, TrackChild web portal became functional in 2012.
  - ▶ The portal provides a database of 'missing' and 'found/recovered' children covered under the Child Protection Services and the Juvenile Justice (Care & Protection) Act, 2015.
- **Helpline:** CHILDLINE (1098) is a 24 × 7 emergency phone outreach service for children in crisis which links them to emergency and long term care and rehabilitation services.

### Central Adoption Resource Authority (CARA)

- CARA primarily deals with adoption of orphan, abandoned and surrendered children through its associated /recognised adoption agencies.

- It functions as the nodal body for adoption of Indian children and is mandated to monitor and regulate in-country and inter-country adoptions.
- CARA is designated as the Central Authority to deal with inter-country adoptions in accordance with the provisions of the Hague Convention on Inter-country Adoption, 1993, ratified by Government of India in 2003.

#### Bal Swaraj-COVID-Care

- The portal is aimed at tracking the children affected by COVID-19 right from the production of children before the Child Welfare Committee (CWC) to the restoration of the children to their parent/guardian/relative and its subsequent follow-up.
- Through the data filled in the portal by the District officers and State officers for each child, the Commission will be able to get information about whether the child is being able to get his/her entitlements, benefits and monetary gains for which the child is entitled to.
- It will also come to know whether the child has been produced before the CWC and the orders are being passed for him/her.

### ◎ CONCLUSION

It should be remembered that there are many notable figures in world history that did not have a mother or a father who served humanity in leading positions, like politicians and scientists. To ensure the safety of all children, especially orphans and abandoned children, governments should initiate awareness-raising campaigns supported by the work of non-governmental organizations that reach out to individuals; while aid organizations that rely on a volunteering workforce should enhance their scope of impact by setting themselves up more strategically on larger territories.

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# TEESTA DISPUTE AND INDIA-BANGLADESH RELATIONS

## CONTEXT

Recently, PM Modi's visited to Bangladesh where the Teesta Dispute was discussed during the talks between the leaders and he reiterated India's sincere and continued efforts to conclude this agreement in consultation with relevant stakeholders.

But still, no agreement has reached yet and it looks gloomy provided the political tension between Centre and the State.

## ◎ BACKGROUND

- India-Bangladesh ties have improved tremendously over the last decade from signing the landmark Land Boundary Agreement (LBA) in 2015 and peacefully managing the maritime boundary issue following a judgement from an international tribunal to the security cooperation between the two states.
- Bangladesh has been an important partner for India in fighting militancy in its northeast region.
- On the economic front, the two countries have signed several MoUs over the years covering various projects including cross-border railways to improve connectivity between India and Bangladesh as well as the northeast region, energy, defence, ports and inland waterways use.
- However, the bilateral ties are far from perfect. The Teesta water dispute is such a contentious issue.

## ◎ ANALYSIS

### What is the dispute?

At the core of the dispute is the shortage of water in the dry season as a result of retreating Teesta glaciers as a result of climate change.

- Demarcation (1947):** The root of the disputes over the river can be found in the report of the **Boundary Commission (BC)**, set up in 1947 under **Sir Cyril Radcliffe**, to demarcate the boundary line between West Bengal and East Bengal.
  - All India Muslim League demanded the Darjeeling and Jalpaiguri districts on the grounds that they are the catchment areas of Teesta River system. Members of the Indian National Congress and the Hindu Mahasabha opposed this.
  - In the final declaration the BC gave a major part of the Teesta's catchment area to India as both were non-Muslim-majority areas.

- 1970s:** Before 1971, no serious dialogue took place on water issues between India and East Pakistan, but after the 1971, India and Bangladesh began discussing their transboundary water issues.
- 1972:** In 1972, the India-Bangladesh Joint Rivers Commission was established.
  - In its initial years, the most important concerns of both countries were the status of river Ganges, construction of the Farakka barrage and sharing of water from the rivers Meghna and Brahmaputra.
- 1983:** In 1983, an ad hoc arrangement on sharing of waters from the Teesta was made, according to which Bangladesh got 36% and India 39% of the waters, while the remaining 25% remained unallocated.
- 1996:** Although the issues related to the distribution of waters from the Teesta were discussed between India and Bangladesh, the river gained prominence only after the two countries signed the **Ganga Water Treaty in 1996**.
- 2011:** The two countries almost concluded a water-sharing treaty in 2011 under which India would get 42.5 per cent and Bangladesh around 37.5 per cent of the water during the dry season, but it was vetoed by the West Bengal Chief Minister, as water supply is a state subject in India.

### Teesta River

- The Teesta River, the fourth largest transboundary river between the two countries.
- It is a tributary of the Jamuna (the largest tributary of Brahmaputra) which flows through the Indian state of Sikkim and West Bengal to enter Bangladesh.
- It originates from the Pahunri (or Teesta Kangse) glacier, flows through Darjeeling district and the cities of Rangpo, Jalpaiguri and Mekhliganj. It joins the Jamuna River at Fulchhari in Bangladesh.



### Why Teesta matters to both countries?

- **Bangladesh:** For Bangladesh, it covers about 14 per cent of the total cropped area and about 7.3 per cent of its population relies on the river for direct livelihood.
- **India (West Bengal):** For West Bengal, the river is important to sustain its five northern districts of Darjeeling, North and South Dinajpur, Cooch Behar and Jalpaiguri, which is some of the poorest farming districts in West Bengal.
  - ▶ There is another matter of the Kolkata port drying up due to silting which requires more water, especially during the lean season.

### Implications for India-Bangladesh Relations

- Indian foreign policy in the region has had limited success in securing bipartisan support for deeper cooperation with India.
- India's relations with most of its immediate neighbours have been party or individual-oriented. Once the power is reversed in many of the neighbouring countries, there are noticeable changes in India's relations with these countries subsequently.
- While Teesta itself is not a highly political issue in India barring northern West Bengal, it is a highly politically charged topic in Bangladesh which is often an election issue raised by both the main national parties.
- For the 2018 Bangladesh general elections, the Awami League stressed on cooperating with India for sharing the waters in the Teesta in its election manifesto.
- When the Bangladesh Nationalist Party (BNP) government was in power in Bangladesh from 2001 to 2006, India witnessed an increase in the insurgency in the northeast, whose security condition is already at stake due to India's poor connectivity.
- It was only brought under control due to consistent support and cooperation from the Awami League (Sheikh Hasina) government post-2009.

- BNP has consistently had a pro-Pakistan and Pro-China stance – a policy continued from General Ziaur Rahman's time and used anti-India rhetoric as a major part of its election campaigns over the years.
- Bangladesh remains a key swing state in South Asia as far as the Chinese involvement in the region is concerned. Visiting of Xi Jinping in 2016 and the two countries and signing multiple agreements is already a concern for India.
- China has also been the major supplier of military equipment to Bangladesh, selling equipment between 2000 and 2020, which accounts for 65 per cent of total defence imports.
- Bangladesh has been engaging China in terms of various projects under the Belt and Road Initiative (BRI).
- Teesta, therefore, is not merely a transboundary water dispute but an important tenet of Bangladesh's domestic politics and the developing geopolitics in the region.

### ◎ CONCLUSION

- This situation is only going to worsen with time and the inter-linking of rivers can only be a stop-gap measure as these rivers, Ganga, Brahmaputra and their tributaries are themselves witnessing reduced base flow. Given commonalities on both sides in terms of a largely agrarian economy along the Teesta basin, there are some common solutions that both countries could explore to deal with an evolving reality of a water-stressed future.
- At present, an agreement to the dispute is certainly required in a timely manner to retain the progress made in the bilateral relations whether it's the security cooperation, improving trade or India's connectivity initiatives towards the east, including its own northeast and to prevent Bangladesh from being completely subsumed in the Chinese sphere of influence.

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# WHY THE DRACONIAN SEDITION LAW MUST GO

## CONTEXT

The Supreme Court, in 'Vinod Dua', has held that every journalist is entitled to protection from sedition as defined in the Kedar Nath judgment. A national consensus on the removal of the provision is called for.

### ◎ BACKGROUND

- NCRB data shows that between 2016 to 2019, there has been a whopping 160 per cent increase in the filing of sedition charges with a conviction rate of just 3.3 per cent. Of the 96 people charged in 2019, only two could be convicted.
- In the recent case, the Court relied on the Kedar Nath judgement in which the apex court had held that a citizen has the right to say or write whatever he likes about the government or its measures by way of criticism so long as he does not incite people to violence against the government or with the intention of creating public disorder.
  - ▶ The Court concluded that statements made by Dua about masks, ventilators, migrant workers, etc. were not seditious and were mere disapprobation so that Covid management improves.
  - ▶ The same were certainly not made to incite people to indulge in violence or create any disorder.

### ◎ ANALYSIS

#### What is Section 124-A?

- It defines sedition as an offence committed when "any person by words, either spoken or written, or by signs, or by visible representation, or otherwise, brings or attempts to bring into hatred or contempt, or excites or attempts to excite disaffection towards the government established by law in India".
- Disaffection includes disloyalty and all feelings of enmity.
- However, comments without exciting or attempting to excite hatred, contempt or disaffection, will not constitute an offence under this section.

#### Punishment for the Offence of Sedition:

- Sedition is a non-bailable offence. Punishment under the Section 124A ranges from imprisonment up to three years to a life term, to which fine may be added.
- A person charged under this law is barred from a government job.

- They have to live without their passport and must produce themselves in the court at all times as and when required.

#### Section 124-A in India: history

- Originally drafted in 1837 by Thomas Macaulay, it was not a part of the original Indian Penal Code of 1860 and treason was confined just to levying war.
- It was Sir James Fitzjames Stephen who subsequently got it inserted in 1870 in response to the Wahabi movement.
- Initially, the section only used the term "disaffection", which was interpreted by colonial judges to refer to acts or speeches that incited people to disobey the government.
- However, once the British realized that clever Indian nationalists were taking advantage of the loophole in the law to frame incendiary speeches that made no mention of disobedience, they added the words "hatred" and "contempt", more or less turning the offence into one for capturing thought crimes.
- Under the sedition provision, the colonial government persecuted nationalist politicians, journalists and press owners, as well as writers and poets.
- Strangely, the Fundamental Rights Sub-Committee (April 29, 1947) headed by Sardar Patel included sedition as a legitimate ground to restrict free speech. When Patel was criticised by other members of the Constituent Assembly, he dropped it.
- Immediately after the Constitution came into being, the Supreme Court struck down government restrictions upon a communist magazine called the Cross Roads, as well as the Rashtriya Swayamsevak Sangh magazine, The Organiser.
- Immediately after that, the first Parliament amended Article 19(2) substantially, broadening its scope by including "public order" among the permissible grounds of restriction of free speech, while also narrowing its operation by adding the word "reasonable" before "restrictions".
- Before the amendment to Article 19(2), the Punjab high court had already held that sedition was incompatible with free speech in a democratic republic, and had struck it down as unconstitutional in Tara Singh Gopi Chand case (1951).

- After the amendment, the Allahabad high court did the same. Ultimately, the matter wound its way up to the Supreme Court, which handed down its decision in 1962.
- In a landmark judgement in the Kedar Nath Singh vs State of Bihar case, five judges of the Supreme Court upheld sedition as constitutional.

### Supreme Court's observation in Kedar Nath Singh case

- In this decision it was observed by the Supreme Court that for the stability of the state it is essential to recognize the activities against the state as an offence because the visible symbol of the state is the Government established by the law.
- The very existence of the state will be in danger if the Government established by law is destabilized.
- Hence any acts within the meaning of Section 124 A which have the effect of subverting the Government by bringing that Government into contempt or hatred, or creating disaffection against it, would be within the penal statute because the feeling of disloyalty to the Government established by law or enmity to it imports the idea of tendency to public disorder by the use of actual violence or incitement to violence.
- The court clarifies that it does not take away the fundamental right of right to speech and expression but is just a reasonable restriction which is essential for the security and sovereignty of the state.

### After Effect of the Judgement

- In 2011, while deciding a case under now-defunct **Terrorist and Disruptive Activities (Prevention) Act (Tada)**, the court held that a member of a terrorist organization could not be convicted for mere membership, unless he had been involved in inciting people to lawless action.
- Also, in the famous **Shreya Singhal case (2013)**, the court distinguished between advocacy" and incitement", and held that only the latter could be punished consistent with **Article 19(2)**.
- In Shreya Singhal's landmark judgement, **section 66A of Information Technology Act** was struck down as it was considered as unconstitutional and vague, the court held that the section is so vague

that neither the accused know what the offence is nor the authorities are clear on what the charges should be.

- In another judgement of **Dr. Binayak Sen v. State of Chhattisgarh (2011)**, he was accused of sedition against Chhattisgarh Government, as he was alleged to have supported the Naxalites thereby violating the provision of Chhattisgarh Special Public Security Act 2005.

### Why the law must go?

- **Synonymous of anti-national:** The law has become synonymous with being anti-national even when the law does not say that sedition is an act against the country or the nation.
- **Against the spirit of democracy:** It is a colonial law, which entered Indian statutes in 1860, and is against the spirit of democracy. Many democracies, including Britain where this law originated, have scrapped it.
- **Misuse:** As long as the Act remains on the statute book, there would remain chances of its misuse.

- Mahatma Gandhi described it as the "prince among the political sections of the Indian Penal Code designed to suppress the liberty of the citizen."
- Nehru had described it as "highly objectionable and obnoxious" which "should have no place in any body of laws that we might pass". Nehru said, "The sooner we get rid of it the better."

### ◎ CONCLUSION

- The sedition law has been in debate ever since it was brought into force by the colonial British rulers. Still, the law has survived in India through governments headed by from Nehru to the current political regime.
- In 2018, even the Law Commission had recommended that the sedition law should not be used to curb free speech. Now, the time has now come to review the Kedar Nath Singh case, which upheld sedition. The case's broad and vague "tendency to disrupt public order" formulation has been replaced by a much tighter "incitement" standard.

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# INDIA'S GDP FALL

## CONTEXT

The recent government estimates released show that India's GDP contracted by 7.3% in 2020-21. While the pandemic has hit growth in countries across the world, several trends over the last decade show that the Indian economy was already worsening in the years before Covid-19.

### ◎ BACKGROUND

- To understand this, fall in perspective, remember that between the early 1990s until the pandemic hit the country, India grew at an average of around 7% every year.
- One is to look at this as an outlier — after all, India, like most other countries, is facing a once-in-a-century pandemic — and wish it away.
- The other way would be to look at this contraction in the context of what has been happening to the Indian economy over the last decade.

### ◎ ANALYSIS

#### Historical GDP data

- Between the early 1990s until the pandemic hit the country, India grew at an average of around 7% every year.
- After the decline in the wake of the Global Financial Crisis, the Indian economy started its recovery in 2013.
- Back then, quarterly GDP growth fell from 10.3% in March 2011 to 4.9% in June 2012. However, the economy started recovering after 2011-12.
- Annual GDP growth fell from 8.5% in 2010-11 to 5.2% in 2011-12. This contraction was followed by a sharp recovery until 2016-17.
- This has not been the case this time and GDP growth has been falling continuously since 2017-18.

#### Reason for downfall in GDP between FY18-FY20

Private consumption and investment had collapsed even before the pandemic

- **Fall in nominal growth was bigger**
- Nominal GDP growth in 2019-20 fell to just 7.2%, the lowest since 1975-76. The 2019-20 Union Budget assumed a 12% nominal growth. Nominal GDP is crucial for revenue collections, as taxes are a fraction of nominal incomes. The sharp fall in nominal growth was a big reason for a huge shortfall in tax collections in 2019-20. According

to data from the Controller General of Accounts, which works under the ministry of finance, gross tax revenue collections were just 81.6% of the budget estimates in 2019-20, the lowest since 2000-01.

- As the ripples of demonetisation and a poorly designed and hastily implemented Goods and Services Tax (GST) spread through an economy that was already struggling with massive bad loans in the banking system, the GDP growth rate steadily fell from over 8% in FY17 to about 4% in FY20, just before Covid-19 hit the country.
- **Both current and future drivers of growth collapsed**
- Consumption demand is the biggest driver of economic growth in India. In 2019-20, Private Final Consumption Expenditure (PFCE) had a share of 57% in India's GDP. PFCE growth collapsed to 2.7% in the March 2020 quarter, the lowest since June 2012.
- Given the strengthening headwinds to consumption demand, firms started shelving investment plans. This can be seen in Gross Fixed Capital Formation (GFCF) contracting at an increasing rate for three consecutive quarters ending March 2020. A collapse in investment demand has adverse implications for future growth potential of the economy. It was only government expenditure which was acting as a counter-cyclical force to some extent.

#### Why covid was the last nail in the coffin?

- **Rail, road movement**
  - Over 30% of all industrial goods in India are transported via trains. So, railway freight volumes become an important indicator of economic activity in the country.
  - With many parts of India, including metro cities like Mumbai and Delhi, under state government-imposed lockdowns, daily average railway freight volumes in India have dropped by 11% month-on-month in April, according to Indian Railways data.
  - The fall in railway freight volume could also be an indicator of falling demand in parts of the country.

- **Curfews curb mobility**

- ▶ With partial and full curfews imposed in certain Indian cities, the number of people moving out of their homes has dropped.
- ▶ As per Apple's driving index, which is compiled monthly on the basis of the number of requests made on Apple Maps for directions, Indians across major cities are commuting far lesser in April than in the previous three months.

- **Unemployment on rise**

- ▶ One of the biggest impacts of the lockdowns in 2020 was a sharp rise in unemployment, especially in the unorganised sectors. In April 2020, unemployment in India spiked to 23%.
- ▶ However, as the country reopened, the job market started recovering and by February 2020, the unemployment rate fell to 6.9%.

- **Weak business activity**

- ▶ All these headwinds reflected in Nomura's India Business Resumption Index, which shows that the business activity in India has taken a beating. The index takes into account parameters such as Google mobility indices, Apple's driving mobility data, power demand in India, and the labour force participation rate.
- ▶ On April 11, the index fell to 90.4 from 99.3 in the first week of February.

### What needs to be done?

- **Universalise PDS for a year:** The first fiscal intervention should be in making food available to as many as possible. That can free substantial amounts of purchasing power for other kind of consumptions. With inequalities remaining large within the structure of Indian economy, this pandemic can be an opportunity for redistributive measures. Universalising the public distribution system (PDS) would be a good starting point.
- **Expanding employment guarantee to urban areas:** Given the sharp drop in GDP, opportunities in urban areas are also expected to shrink. It is of paramount importance that circular migrants are absorbed into the urban employment set. But the absorption may not be an easy task when jobs are generally disappearing. Expansion of employment guarantee scheme in urban area is thus necessary to stabilise the economy.
- **Global Shift:** Global trends such as digitization and automation, shifting supply chains, urbanization, rising incomes and demographic shifts, and a greater focus on sustainability, health, and safety can become the hallmarks of the post pandemic economy.
- **Public investment in physical and social infrastructure:** Public investment – at least for some time – is necessary to crowd in private

investment. India has a lack of infrastructure facilities that has been often cited as one of the major reasons behind the failure of industry, particularly manufacturing, to take off and reach a desired level. Building infrastructure creates immediate employment and purchasing power, infusing demand into the system.

### What RBI Annual Report has to say?

- For a self-sustaining GDP growth trajectory post-COVID-19, a durable revival in private consumption and investment demand together would be critical as they account for around 85 per cent of GDP.
- In view of the limited share of government consumption demand in GDP (at around 13 percent in 2020-21), a rebound in private demand is essential to sustain the recovery.
- Typically, post-crisis recoveries have been led more by consumption than investment; however, investment-led recoveries can be more sustainable and can also lift consumption in parts by better job creation.
- In line with the mathematical models built around epidemiological regularities predicting that India's second wave may broadly peak by mid-May 2021, the daily new infections have started to drop recently, though the incidence and replication factor still remain high for comfort.
- Under this outcome, the macro-economic costs of this wave can be limited to Q1:2021-22 with possible spill over into July.

### Other indicators signaling slowdown in economy

- **Index of Industrial Production (IIP)**

- ▶ During April-June 2020, the sector's output dipped by 24.6% as compared to a positive growth of 3.4% in the same period previous year.

- **Purchasing Managers Index (PMI)**

- ▶ The services purchasing managers index plunged by 43.9 points to 5.4 in April 2020, the lowest in the world, hitting single digits for the first time and staying below 50, the dividing line between contraction and expansion, according to data published by IHS Markit.

- **Index of Eight Core Industries (ICI)**

- ▶ Index of Eight Core Industries Contracts 6.5% in FY21.
- ▶ The month over month production of eight core industries, as captured by ICI, declined by 15.1% (P) in April 2021 compared to March 2021 (P) due to emergence of second wave of infectious COVID-19.



**© CONCLUSION**

To sum up, the year gone by has left a scar on the economy. In the midst of the second wave as 2021-22 commences, pervasive despair is being lifted by cautious optimism built up by vaccination drives. Intense national efforts to beat back the virus are coalescing at least to some synchronicity across the

world. Countries are stepping away from vaccine nationalism as the world adapts by learning to survive. A collective global effort to fight the pandemic will surely bring better results than individual countries fighting on their own. The G20 goal of strong, sustainable and inclusive growth may yet be in sight and within reach.

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# ETHICS OF AUTONOMOUS WEAPON

## CONTEXT

The French defense ethics committee has identified the guiding principles and made recommendations relating to methodology, research, use, design, but also training concerning the development of techniques contributing to autonomy in weapons systems. This proposal is being scrutinised by the Ministry.

### ◎ BACKGROUND

Automated devices have long been used in weapon systems employed in military operations on land, at sea or in the air. However, the concept of "autonomous weapon systems", currently used in civil society to condemn the very principle or, in certain international fora, to restrict their use, evokes, in all cases, the idea of a clear disruption in both technology and ethics

Due to the prospects offered by the development of robotics, use of lethal weapon systems described as "autonomous" is a source of ethical questions linked to the very foundations of the military function:

- **How can the operational superiority of our armed forces be maintained without losing our values?**
- **What role should be reserved for humans in warfare?**
- **How do we preserve the moral integrity of combatants?**
- **To what extent will humans be responsible in the conduct of war?**

### ◎ ANALYSIS

#### What is Lethal Autonomous Weapon System (LAWS)?

- There is no agreed definition of lethal autonomous weapon systems that is used in international fora.
- However, it can be understood as lethal weapon system programmed to be capable of changing its own rules of operation particularly as regards target engagement, beyond a determined framework of use, and capable of computing decisions to perform actions without any assessment of the situation by human military command.

#### What is Partially Autonomous Lethal Weapon System (PALWS)?

- A lethal weapon system integrating automation and software: - to which, after assessing the

situation and under their responsibility, the military command 'can assign' the computation and execution of tasks related to critical functions such as identification, classification, interception and engagement within time and space limits and under conditions; - which include technical safeguards or intrinsic characteristics to prevent failures misuse and relinquishment by the command of two vital duties, namely situation assessment and reporting.

#### Reasons for renouncing the use of LAWS

##### Use of LAWS would:

- break the chain of command;
- run counter to the constitutional principle of having liberty of action to dispose of the armed forces;
- not provide any assurance as to compliance with the principles of international humanitarian law (IHL);
- be contrary to our military ethics and the fundamental commitments made by Indian soldiers, i.e. honour, dignity, controlled use of force and humanity.

#### What are the ethical issues associated?

- **Moral acceptability of using force without human intervention**
  - Confidence in our armed actions could be undermined by the feeling of being watched by weapons, fear for safety, and concerns about the absence of humans in the loop or risks of a technological error
- **Risks of Machine Learning**
  - A system designed to identify, designate or even neutralise targets without being able to provide intelligible explanations for its proposals or choices could be regarded with mistrust.
  - Without appropriate control over what the system "learns", it could lead to unexpected and unwanted behaviour outside the intended framework of use.

- **Risk of blurring responsibility in the event of an incident**

- ▶ In the event of an incident involving LAWS causing unacceptable damage or unwanted firing, establishing responsibilities by means of an ex-post investigation could prove difficult
- ▶ It also raises questions like, is it the operational chain of command, from the decision-maker to the soldier who used the system? Who decided to use this system in this environment? Were they aware of the potential error? Was this deployment compliant with doctrine? Were the risks known? Were the risks documented during design?

- **Vulnerabilities induced by Digital Technology**

- ▶ Like other weapon systems, governments and other actors are acquiring offensive cyber capacities with which they could take control of or alter the integrity of a system and change the targeting functions. The lack of ultimate human control over open fire functions could facilitate such diversion.

- **Exogenous Risks**

- ▶ There is a risk of civil society refusing the PALWS employment framework, for philosophical or religious reasons.
- ▶ There is a permanent risk of proliferation for this type of weapon like all others, requiring control and regulation

### **What should be the guiding principles for use of these weapons?**

- The risks of alteration in human control and the acceptability of assigning use of force to a machine should be systematically assessed during research, design, development and use of PALWS.
- The consequences of lethal actions carried out by a PALWS must be systematically evaluated by the command. In particular, only the chain of command shall have authority to change the targets of a mission in progress or to cancel the mission.
- The command should define a framework to

transpose doctrine, i.e. target to be reached, space and time limits, constraints, engagement rules, for each mission performed by a PALWS. A PALWS should never be operated without an employment framework and should never have the capacity to depart from it without intervention by the chain of command.

- In any urgent operational situation, the chain of command must be alerted and must explicitly validate any new PALWS employment framework.
- A PALWS should not be enabled to assign to another PALWS a mission that departs from the initial framework without prior validation by the chain of command.
- The conditions under which continuous machine learning during a mission can be implemented for on-line computation of new tasks should be clearly specified.
- When drafting doctrine on the use of weapon systems, appropriate information on automated decision-making functions should be provided. The conditions and limits of use should be clarified relying on technical and operational performance criteria and relevant ethical considerations.
- The chain of responsibility involved in the definition, design, development, qualification and use of a PALWS should be formally defined in order to clearly identify the respective responsibilities of all the parties involved.

### **◎ CONCLUSION**

India should foster research in the fields of defence artificial intelligence and weapon systems automation for several reasons. First to avoid the country losing ground in the scientific and technological fields; second to counter enemy development of LAWS; and finally, to be able to defend ourselves against this type of weapon in the likely event of their use by an enemy State or terrorist group against our troops or population. Such research must be governed by a strict ethical and legal framework and be conducted in compliance with legal review mechanisms.

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# **SECTION: B**

## **(PRELIMS)**

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## RDSO OF INDIAN RAILWAYS BECOMES THE FIRST INSTITUTION TO BE DECLARED 'SDO'

### ◎ CONTEXT:

Research Design & Standards Organization (RDSO) of Indian Railways has become the first Institution to be declared Standard Developing Organization (SDO) under "One Nation One Standard" mission of BIS (Bureau of Indian Standards) which is Institution under Department of Consumer Affairs.

### About the recognition

- RDSO becomes the first Standard Developing Organization in the country to be granted recognition under the BIS SDO Recognition Scheme.
- RDSO took the initiative to seek recognition by reviewing its Standard Formulation procedures to realign them with the Best Practices of Standardization, encoded in the WTO-TBT "Code of Good Practice" and also mandated by the Bureau (BIS) as essential criteria for recognition as SDO.
- Furthermore, with this recognition, the RDSO's standard formulation procedures will be more focused on consensus-based decision making.
- **Validity:** The recognition is valid for 3 years and will require renewal after completion of the validity period.

### What is BIS SDO scheme?

- The BIS SDO Recognition Scheme has been launched by the Bureau of Indian Standards (BIS).
- The statutory provisions of Section 10(2)(c) of the BIS Act, 2016 and Rule 30 of the BIS Rules, 2018 confer upon Bureau, powers to recognize or accredit any institute in India or outside which is engaged in standardization.
- This policy of recognition of SDOs ensures "One Nation One Standard" for one product or service etc.
- It will lead to the harmonization of standards in the country ensuring WTO-TBT Code of Good Practice for the Preparation, Adoption and Application of Standards.

### Expected benefits

- Larger participation of Industry / Vendors / MSME's / Technology Developers in IR Supply Chain
- Increased competitiveness amongst Industry / Vendors
- Reduction in Cost
- Quantum improvement in Quality of Product & Services
- Smooth Induction of latest evolving & emerging technologies on IR
- Reduced dependence on imports
- Thrust on "Make-in-India"
- Improvement in Ease-of-Doing-Business
- Recognition of RDSO on International Standards Making Bodies
- Integration with Global Supply Chain / Global Trade

**One Nation One Standard mission**

- Deliberated first in 2019, the mission is envisioned on the line of 'one nation, one ration card' scheme in order to ensure quality products in the country.
- The purpose is to converge multiple standards with the BIS which is a recognised national body for standardisation in India.

**Research Designs & Standards Organisation (RDSO)**

- It is the sole R&D Wing of Ministry of Railways, undertaking standardization work for railway sector.
- It is headquartered in Lucknow.
- In 1957, the Central Standards Office and Railway Testing Research Centre (RTRC) were integrated into a single unit as Research Design and Standards Organisation (RDSO).

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## SECTION 304-B

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◎ **CONTEXT:** The Supreme Court has indicated in a judgment that a straitjacket and literal interpretation of a penal provision on dowry death may have blunted the battle against the "long-standing social evil".

◎ **ABOUT:** The Section 304-B (Dowry death) of IPC

- According to Section 304-B, to make out a case of dowry death.
- A woman should have died of burns or other bodily injuries or "otherwise than under normal circumstances" within seven years of her marriage.
- She should have suffered cruelty or harassment from her husband or in-laws "soon before her death" in connection with demand for dowry.
- Whoever commits dowry death shall be punished with imprisonment for a term which shall not be less than seven years but which may extend to imprisonment for life.

**What is the Supreme Court's observation?**

- The phrase "soon before" as appearing in **Section 304-B** of the **Indian Penal Code** cannot be construed to mean 'immediately before'.
- Rather, they left its determination in the hands of the courts. The factum of cruelty or harassment differs from case to case. No straitjacket formulae can therefore be laid down by this court to define what exact the phrase 'soon before' entails.
- Instead, the prosecution is needed to establish existence of "proximate and live link" between the dowry death and cruelty or harassment for dowry demand by the husband or his relatives.
- The phrase "otherwise than under normal circumstances" in the Section also calls for a liberal interpretation.
- Section 304B, IPC does not take a pigeonhole approach in categorizing death as homicidal or suicidal or accidental.
- The judgment also raised concern about the casual way in which trial courts examined accused persons in dowry death cases under **Section 313** of the **Code of Criminal Procedure**.

**Dowry deaths in India**

- It has accounted for 40% to 50% homicides in the country from 1999 to 2018.
- In 2019 alone, 7,115 cases of dowry death were registered under Section 304-B of the Indian Penal Code.
- That's why, the judgment pronounced by a three-judge Bench led by Chief Justice of India called dowry harassment a "pestiferous" crime where women are subjected to cruelty by "covetous" husbands and in-laws.

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## 'WORLD NO TOBACCO DAY' 2021

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◎ **CONTEXT:** The World No Tobacco Day was celebrated and led the pledge by everyone present to abstain from Tobacco.

◎ **ABOUT:** **The World No Tobacco Day 2021**

- World Health Organization (WHO) created World No Tobacco Day in 1987.
- It was to draw global attention to the tobacco epidemic and the preventable death and disease it causes.
- In 1988, Resolution WHA42.19 was passed which called for the celebration of World No Tobacco Day, every year on 31 May.
- Theme: "Commit to Quit" was the theme of the "World No Tobacco Day" 2021
- **India's position:** In India, over 1.3 million deaths are attributable to tobacco use every year amounting to 3500 deaths per day.
  - Economic Costs of Diseases and Deaths Attributable to Tobacco Use in India is amounting to approx 1% of GDP.

### Efforts by Indian Government to have no tobacco

- **Cigarettes Act, 1975:** It mandated display of statutory health warnings in advertisement and on cartons and cigarette packages.
- **Delhi Prohibition of smoking and Non Smokers Health Protection Act', 1997:** This very statute became the model for Central Legislation banning smoking in public places in 2002, on the directions of Supreme Court.
- **Cigarettes and other Tobacco Products (Prohibition of Advertisement and Regulation of Trade, Commerce, Production, Supply and Distribution) Act –COTPA, 2003]**- It aims to provide smoke free public places and also places restrictions on tobacco advertisement and promotion.
- **'Prohibition of Electronic Cigarettes Bill, 2019'** – It prohibits Production, Manufacture, Import, Export, Transport, Sale, Distribution, Storage and Advertisement of e-Cigarettes.
- **The National Health Policy 2017:** The policy have set an ambitious target of reducing tobacco use by 30% by 2025.

### How India performed?

- Prevalence of tobacco use has decreased by six percentage points from 34.6% in 2009-10 to 28.6% in 2016-17.
- Health Ministry work on tobacco control has also been recognized by WHO through Director General's Special Recognition Award in 2021.

## YUVA - PRIME MINISTER'S SCHEME FOR MENTORING YOUNG AUTHORS

◎ **CONTEXT:** The Ministry of Education, Department of Higher Education has launched YUVA-Prime Minister's Scheme For Mentoring Young Authors.

◎ **ABOUT:** YUVA Scheme

- It is an **Author Mentorship programme** to train young and budding authors (below 30 years of age) in order to promote reading, writing and book culture in the country, and project India and Indian writings globally.
- It is a part of **India@75 Project (Azadi Ka Amrit Mahotsav)** to bring to the fore the perspectives of the young generation of writers.
- **Implementing Agency:** The National Book Trust, India under the Ministry of Education will be the Implementing Agency which will ensure phase-wise execution of the Scheme under well-defined stages of mentorship.
- **Publisher:** The books prepared under this scheme will be published by National Book Trust, India; and will also be translated into other Indian languages ensuring the exchange of culture and literature, thereby promoting '**Ek Bharat Shreshtha Bharat**'.

### Significance of the Scheme

- This scheme will help to develop a stream of writers who can write on a spectrum of subjects to promote Indian heritage, culture and knowledge system.
- YUVA will go a long way in laying the foundation of the future leaders of the creative world.

## COMMITTEE ON VARIABLE CAPITAL COMPANY

◎ **CONTEXT:** The expert committee, headed by Dr.K.P. Krishnan on Variable Capital Company has submitted its report on the feasibility of Variable Capital Companies in the International Financial Services Centres to the International Financial Services Centres Authority (IFSCA).

### What is Variable Capital Company (VCC)?

- The Variable Capital Company (VCC) is a new corporate entity structure under which several collective investment schemes (whether open-end or closed-end) may be gathered under the umbrella of a single corporate entity and yet remain ring-fenced from each other.
- The new corporate entity structure gives funds an alternative to unit trusts, limited partnerships, limited liability partnerships and companies.
- A key characteristic of the VCC is its umbrella structure is that it allows the sub-funds to share a board of directors and have common service providers, such as the same fund manager, custodian, auditor and administrative agent.
- Certain administrative functions, for instance, the holding of general meetings and preparation of prospectuses, can also be consolidated.
- Where a VCC is set up as an umbrella fund with several sub-funds, members may hold shares that are referenced to a particular sub-fund held by the VCC.

### About the Committee

In order to ensure India's IFSC is at par with the developments in other parts of the world, IFSCA had set up a Committee of Experts headed by Shri K P Krishnan (IAS-Retd.), for examining the feasibility of the Variable Capital Company (VCC) in India with the following terms of reference:

- Comprehensive analysis of fund structures under Indian Trust Act and VCC.
- To examine VCC structure and suggest appropriate model/ framework that may significantly enhance the competitiveness of IFSC in India.
- Feasibility of introducing VCC as separate chapter in Companies Act, 2013 versus need of enacting a separate legislation.
- To explore alternative structures having characteristics like VCC.
- The Committee may also deliberate on any issues which may be considered necessary but not mentioned in the above terms of reference.

### Key-recommendations

- The Committee recommended the adoption of a **VCC-like legal structure** for the purpose of conducting **fund management** activity in IFSCs.
- The Committee recognized that the legal framework governing entities that undertake fund management should provide for:
  - certainty and clarity to investors
  - effective segregation and ring-fencing of different pools of asset
  - the ability to issue different classes of shares
  - alterations to the funds' capital structure without regulatory approvals
  - the freedom to choose the appropriate accounting standards applicable to funds with different characteristics the ability to wind up quickly

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## BHARAT RATNA PROFESSOR RAO RECEIVES THE ENI INTERNATIONAL AWARD

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◎ **CONTEXT:** Bharat Ratna Professor C.N.R. Rao has received the International Eni Award 2020 for research into renewable energy sources and energy storage.

◎ **ABOUT:** International ENI Award

- It is also called the Energy Frontier award.
- This is considered to be the Nobel Prize in Energy Research.
- The award has become internationally recognized over the years in the field of energy and environmental research.
- Aim: It aims to promote better use of energy sources and encourage new generations of researchers in their work.
- It bears witness to the importance that Eni places on scientific research and innovation.
- It includes a cash prize and a specially minted gold medal.

### About the Recognized work

- Professor Rao has been working on hydrogen energy as the only source of energy for the benefit of all mankind.

- The Energy Frontiers award has been conferred for his work on metal oxides, carbon nanotubes, and other materials and two-dimensional systems which includes graphene, boron-nitrogen-carbon hybrid materials, and molybdenum sulfide (Molybdenite - MoS<sub>2</sub>) for energy applications and green hydrogen production.

### What is the Significance of his work?

- It will be helpful in construction of-
  - hydrogen storage systems
  - supercapacitors with high specific power and an increased number of charge-discharge cycles
- Furthermore, it will become an increasingly important part of the renewable energy sector.

### What is Green Hydrogen?

- It is pure hydrogen produced using renewable energy sources such as wind or solar power.
- It could help bring the world to net-zero emissions.
- Hydrogen is get through when electrical current is passed through a tank of water splits the molecule into its two constituent elements, Hydrogen and Oxygen. This is called **electrolysis**.
- If the electricity is generated from renewable sources such as solar or wind, production of hydrogen in this way emits no greenhouse gasses.

### Different shades of hydrogen:

- Brown hydrogen is produced by using coal where the emissions are released to the air
- Grey hydrogen is produced by the natural gas where the associated emissions are released to the air
- Blue hydrogen is produced through natural gas, where the emissions are captured using carbon capture and storage

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## RISE IN STRIPED HYENA POPULATION

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◎ **CONTEXT:** Indian striped hyena raises hope that the species is re-establishing itself in the buffer zone of the Mudumalai Tiger Reserve (MTR).

◎ **ABOUT:** Indian Striped Hyena

- **Scientific name:** Indian striped hyena (*Hyaena hyaena*)
- It is mammal of the Carnivora order and Hyaenidae family.
- They whoop, rumble, low, and laugh, when they are excited or on sensing danger.
  - Hyenas are like wild dogs and are top predators that compete with other species.
  - Striped hyenas usually lived alone and difficult to spot due to their reclusive nature.
- **Location:** They are found in India, Central Asia, North and East Africa and West Asia.
- Camera trap images from 2012 to 2020 reveal that the striped hyena population is very restricted to the North Eastern Slope (NES) and Segur forest ranges.
- The hotspots of striped hyena in the region are Srikakulam, Parvathipuram forest area, Chodavaram and Devarapalle.



- **Conservation Status:** The International Union for Conservation of Nature (IUCN) has categorised it as 'Near Threatened' species on a global scale.
- **Reason for decline:** It started declining in the Sigur plateau in the 1980s and 90s, because people reared cattle in pens. After the carnivores preyed on their cattle, the farmers would poison whatever remained of the carcasses of cattle.
- It also caused death of vultures.
- **Threats:** lack of monitoring and loss of habitat.

#### Reason behind the rise in number

- This could be due to a number of factors, including better protection of carnivores such as tigers, which in turn would mean more food availability for species such as vultures and hyenas that scavenge on tiger kills.
- Elimination of illegal tourism
- Lack of disturbance in the buffer zone
- Conservation Efforts
- Creation of the latest range maps on the species distribution in the Eastern Ghats region.
- The Eastern Ghats Wildlife Society (EGWS) is assisting IUCN Hyaena Specialist Group as a local collaborator.
- The process of range mapping is unique as people from across Eastern Ghats belt can report sightings of the species.

#### About Mudumalai Tiger Reserve (MTR)

- The Mudumalai National Park and Wildlife Sanctuary is declared as a tiger reserve.
- It lies in the northwestern side of the Nilgiri Hills, Tamil Nadu.
- It shares its boundaries with the states of Karnataka and Kerala.
- The sanctuary is divided into five ranges – Masinagudi, Thepakadu, Mudumalai, Kargudi and Nellakota.
- The protected area is home to several endangered and vulnerable species such as Indian elephant, Bengal tiger, gaur and Indian leopard.
- It is also a home to the critically endangered Indian white-rumped vulture and long-billed vulture.

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## CHINA'S 'ARTIFICIAL SUN' EXPERIMENTAL FUSION REACTOR SET A NEW RECORD

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- ◎ **CONTEXT:** China's 'artificial sun' EAST achieved a peak temperature of 288 million degrees Fahrenheit, which is over ten times hotter than the sun, for 20 second.
- ◎ **ABOUT:** China's 'Artificial Sun' EAST
  - The Experimental Advanced Superconducting Tokamak (EAST) reactor is an advanced nuclear fusion experimental research device located at the Institute of Plasma Physics of the Chinese Academy of Sciences (ASIPP) in Hefei, China.
  - The purpose of the artificial sun is to replicate the process of nuclear fusion, which is the same reaction that powers the sun.

- The EAST is one of three major domestic tokamaks that are presently being operated across the country.
- It first became operational in 2006.
- EAST has set several records for the duration of confinement of exceedingly hot plasma.
- The EAST project is part of the International Thermonuclear Experimental Reactor (ITER) facility, which will become the world's largest nuclear fusion reactor when it becomes operational in 2035.
- The project includes the contributions of several countries, including India, South Korea, Japan, Russia and the United States.

### Working of EAST

- The EAST Tokamak device is designed to replicate the nuclear fusion process carried out by the sun and stars.
  - Nuclear fusion is a process through which high levels of energy are produced without generating large quantities of waste.
  - For nuclear fusion to occur, tremendous heat and pressure are applied on hydrogen atoms so that they fuse together.
  - The nuclei of deuterium and tritium — both found in hydrogen — are made to fuse together to create a helium nucleus, a neutron along with a whole lot of energy.
- Fuel is heated to temperatures of over 150 million degrees C so that it forms a hot plasma "soup" of subatomic particles. With the help of a strong magnetic field, the plasma is kept away from the walls of the reactor to ensure it does not cool down and lose its potential to generate large amounts of energy.
- The plasma is confined for long durations for fusion to take place.

### Future aspects

- The next goal for the scientists behind the experimental reactor is to maintain the high temperature for a long period of time.
- Previously, the EAST had reached a record temperature of 100 million degrees Celsius in 2018.

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## ETHICS OF AUTONOMOUS WEAPON

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◎ **CONTEXT:** NASA has selected two missions DAVINCI+ and VERITAS to the planet Venus, Earth's nearest neighbour.

◎ **ABOUT:**

### The Missions

- The missions called DAVINCI+ and VERITAS have been selected based on their potential for scientific value and the feasibility of their development plans.
- NASA is expected to launch it in between 2028-2030.
- Both missions are part of the space agency's Discovery Program, which began in 1992 to give scientists the chance to launch some missions that use fewer resources and have shorter developmental times.

### DAVINCI+

- **DAVINCI+** is short for 'Deep Atmosphere Venus Investigation of Noble gases, Chemistry, and Imaging' and is the first US-led mission to the planet's atmosphere since 1978.

- It will try to understand Venus' composition to see how the planet formed and evolved. This mission also consists of a descent sphere that will pass through the planet's thick atmosphere and make observations and take measurements of noble gases and other elements.
- This mission will also try to return the first high resolution photographs of a geological feature that is unique to Venus.
- This feature, which is called "tesserae" may be comparable to Earth's continents, NASA says.
- The presence of tesseraes may suggest that Venus has tectonic plates like Earth.

### VERITAS

- The **second mission called VERITAS** is short for 'Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy' and will map the planet's surface to determine its geologic history and understand the reasons why it developed so differently from Earth.
  - VERITAS will orbit Venus with a radar that will help to create a three dimensional reconstruction of its topography which might be able to tell scientists if processes such as plate tectonics and volcanism are still active there.
  - This mission will also map the emissions from Venus's surface that may help in determining the type of rocks that exist on Venus—a piece of information that is not exactly known yet.
  - It will also determine if active volcanoes are releasing water vapour into the atmosphere.

### Why Venus has been chosen?

- The results from DAVINCI+ are expected to reshape the understanding of terrestrial planet formation in the solar system and beyond.
- Taken together, both missions are expected to tell scientists more about the planet's thick cloud cover and the volcanoes on its surface.
- Scientists speculate about the existence of life on Venus in its distant past and the possibility that life may exist in the top layers of its clouds where temperatures are less extreme.

#### Venus

- Venus is the second-brightest object in the sky after the moon.
- It appears bright because of its thick cloud cover that reflects and scatters light.
- Venus is called the Earth's twin because of their similar sizes, the two planets have significant differences between them.
- The planet's thick atmosphere traps heat and is the reason that it is the hottest planet in the solar system, despite coming after Mercury, the closest planet to the Sun.
- Surface temperatures on Venus can go up to 471 degrees Celsius, which is hot enough to melt lead.
- Venus moves forward on its orbit around the Sun but spins backwards around its axis slowly. This means on Venus the Sun rises in the west and sets in the East.
- Venus also does not have a moon and no rings.

## DRDO DEVELOPS CRITICAL NEAR ISOTHERMAL FORGING TECHNOLOGY FOR AEROENGINES

### ◎ CONTEXT:

Defence Research and Development Organisation (DRDO) has established the near isothermal forging technology to produce all the five stages of high-pressure compressors (HPC) discs out of difficult-to-deform titanium alloy using its unique 2000 MT isothermal forge press.

### About the Critical Near Isothermal Forging Technology

- This technological breakthrough was achieved by the DRDO's premier metallurgical laboratory, the Hyderabad-based Defence Metallurgical Research Laboratory (DMRL).
- It involved developing complex titanium and nickel-based alloys that can withstand temperatures of more than 1,000 degrees Celsius
- With this development, India has joined the league of limited global engine developers to have the manufacturing capabilities of such critical aero engine components.
- DMRL has transferred the technology to M/s MIDHANI through a licensing agreement for technology transfer (LATOt) to meet the bulk production requirements.
- It will be jointly produced and successfully supplied to the HAL, Bengaluru for fitment into Adour engine that powers the Jaguar and Hawk aircrafts.
- Apart from DMRL and HAL (E), various agencies such as MIDHANI, CEMILAC and DGAQA worked in unison to establish this crucial technology.

### Significance

- Like in any aero engine, the high value HPC drum assembly needs to be replaced after a specified number of operations or in the case of damage which is quite large and expensive.
- A HPC drum is a highly stressed sub-assembly and is also subjected to low cycle fatigue and creep at elevated temperatures.
- The raw materials and forgings for the HPC drum are required to be of the highest quality which can meet the specified combination of static and dynamic mechanical properties.
- The methodology adopted by DMRL is generic in nature and can be tuned to develop other similar aero-engine components.

### DRDO

- DRDO is the R&D wing of Ministry of Defence.
- It aims to empower India with cutting-edge defence technologies and a mission to achieve self-reliance in critical defence technologies and systems.
- DRDO was formed in 1958 from the amalgamation of the then already functioning Technical Development Establishment (TDEs) of the Indian Army and the Directorate of Technical Development & Production (DTDP) with the Defence Science Organisation (DSO).

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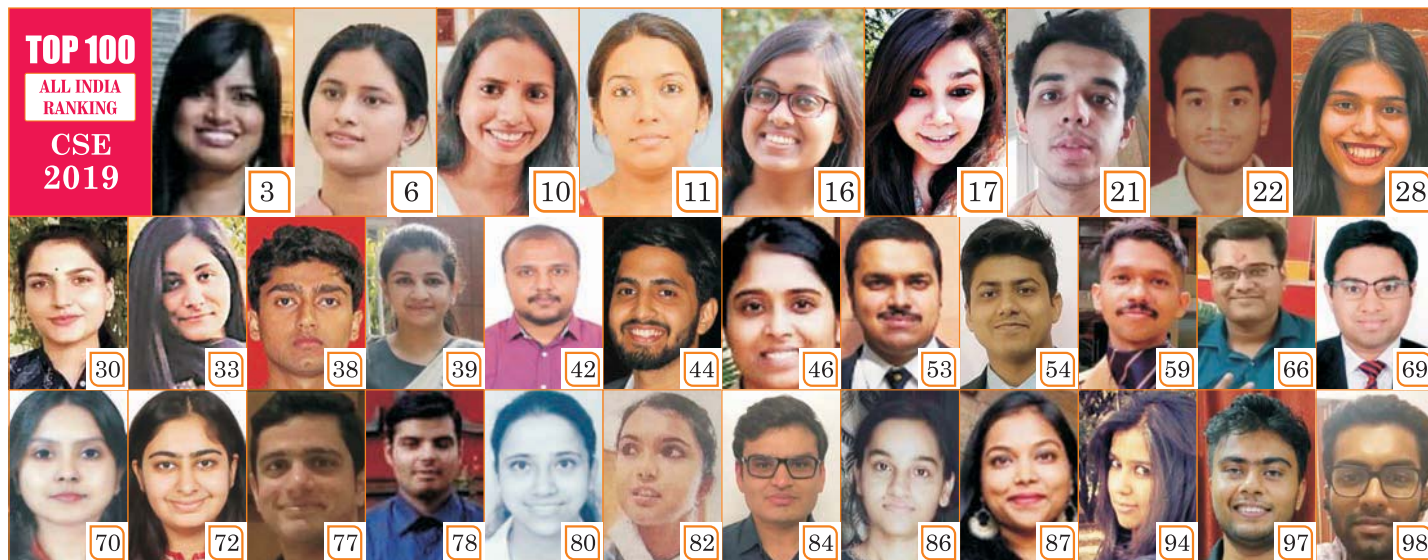
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  - Geography
  - History
  - Public Administration

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# SUCCESS IS A PRACTICE WE DO!

