Topics

- Mass death of Penguin (h5N1)
- electronic Fibre
- hu1F5
- SMEAR MICROSCOPY
- New solar power rules Essay

THE HINDU

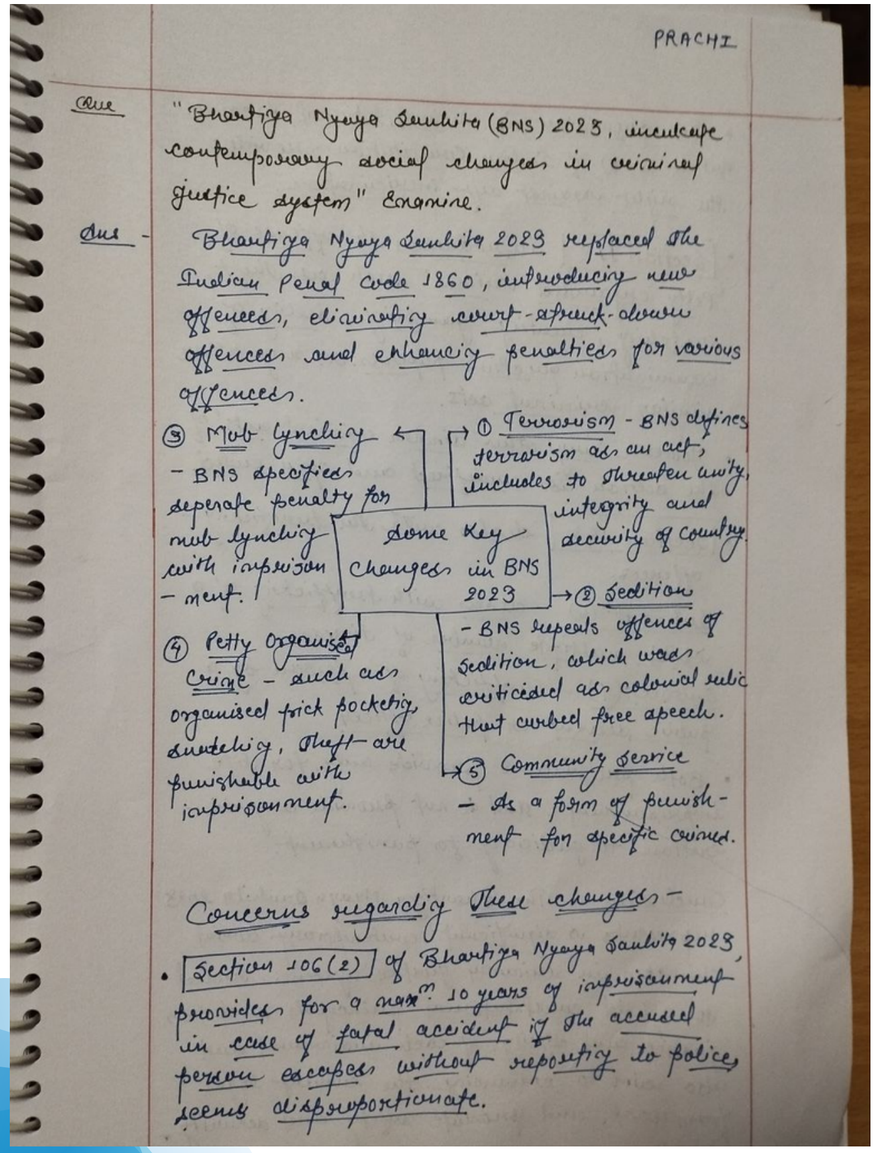
By saurabh pandey sir

Essay Topic

“ Resource constraints and Resource distribution will decide new world order”

"संसाधन की कमी और संसाधन वितरण नई विश्व व्यवस्था तय करेंगे"

Answer review



PRACHI

Que "Bhartiya Nyaya Sanhita (BNS) 2023, encompass contemporary social changes in criminal justice system" Examine.

Ans - Bhartiya Nyaya Sanhita 2023 replaced the Indian Penal Code 1860, introducing new offences, eliminating court-struck-down offences and enhancing penalties for various offences.

Some Key changes in BNS 2023

① Terrorism - BNS defines terrorism as an act, includes to threaten unity, integrity and security of country.

② Sedition - BNS repeals offences of sedition, which was criticised as colonial relic that curbed free speech.

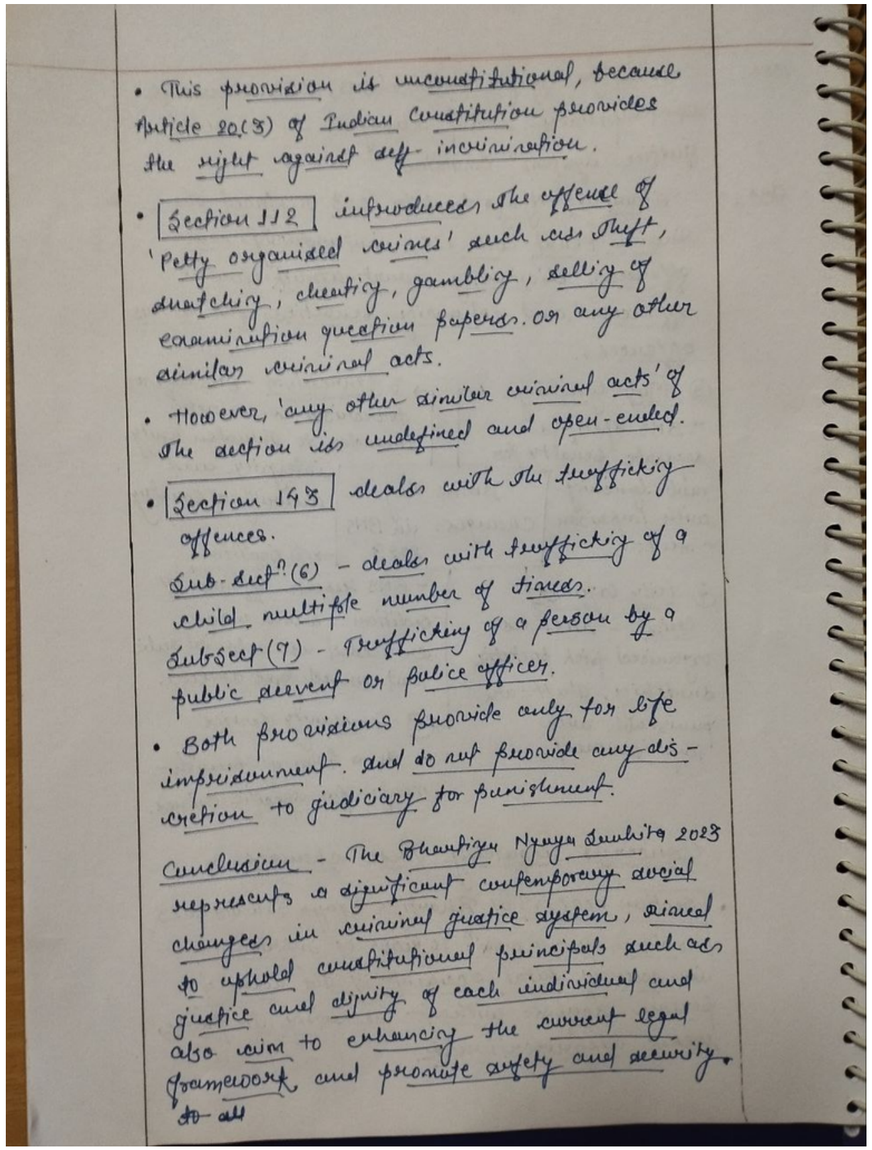
③ Mob lynching - BNS specifies seperate penalty for mob lynching with imprisonment.

④ Petty Organised Crime - such as organised pick pocketing, snatching, theft are punishable with imprisonment.

⑤ Community service - As a form of punishment for specific crimes.

Concerns regarding these changes -

- Section 106(2) of Bhartiya Nyaya Sanhita 2023, provides for a max^m 10 years of imprisonment in case of fatal accident if the accused person escapes without reporting to police, seems disproportionate.



- This provision is unconstitutional, because Article 20(3) of Indian Constitution provides the right against self-incrimination.
- Section 112 introduces the offence of 'Petty organised crimes' such as theft, snatching, cheating, gambling, selling of examination question papers, or any other similar criminal acts.
- However, 'any other similar criminal acts' of the section is undefined and open-ended.
- Section 143 deals with the trafficking offences.

Sub-sect^n (6) - deals with trafficking of a child multiple number of times.

Subsect (7) - Trafficking of a person by a public servant or police officer.

- Both provisions provide only for life imprisonment. and do not provide any discretion to judiciary for punishment.

Conclusion - The Bhartiya Nyaya Sanhita 2023 represents a significant contemporary social changes in criminal justice system, aimed to uphold constitutional principals such as justice and dignity of each individual and also aim to enhancing the current legal framework and promote safety and security to all

Influenza A H5N1 detected in dairy cows in 6 states in the U.S.

The exact extent of the spread of H5N1 in cows has not yet been ascertained since cattle are not routinely tested for avian influenza and the symptoms have been relatively mild

Bani Jolly
Vinod Scaria

H5N1 outbreak in dairy cows

The H5N1 outbreak in dairy cows began in late March 2024 in Texas

Symptoms: The affected animals displayed symptoms including loss of appetite, low-grade fever, and reduced lactation. SPECIAL ARRANGEMENT

- This is the first time that H5N1 has been detected in cattle. It raises concerns about potential transmission routes
- So far, H5N1 has been detected in over 12 herds from six states — Texas, Kansas, Michigan, New Mexico, Idaho and Ohio
- In Texas, wild birds and cats that were in proximity to the affected farms have tested positive for the virus
- Transmission of the virus within cattle has not yet been ruled out
- In April 2024, a human infection of H5N1 was reported from Texas
- In general, the risk of infections for humans remains low, but farm workers are at a higher risk of getting infected
- H5N1 infections in humans can range from mild symptoms to severe illness and even death
- **So far, 800 sporadic human H5N1 cases have been reported from over 20 countries, with a case-fatality ratio of 53%**

Avian influenza (bird flu) is a highly contagious viral infection that primarily affects birds. An emerging new lineage 2.3.4.4b of avian influenza has been spreading across the globe since late 2020, carried by migratory birds following specific routes. This panzootic has a significant effect on the avian population with disastrous consequences to the ecology and significant economic loss affecting poultry across the world. In rare instances, the virus can infect mammals from birds causing spillovers, and in recent years, several such instances of spillovers spanning over 200 species have been noted, the most recent being polar bears in Antarctica. Close contact with infected animals could mean the virus could spill over infecting humans and this comes with a significantly large fatality rate.

In late March 2024, a multistate outbreak of H5N1 in dairy cows was detected in the U.S. In what started as a mystery disease affecting dairy herds in Texas, the U.S. Department of Agriculture (USDA) detected the highly pathogenic strain of the virus in herds across the states of Texas and Kansas. The affected animals displayed symptoms including loss of appetite, low-grade fever, and reduced lactation. This marked the first time H5N1 had been transmission routes and the broader impact on the dairy and meat industry. To date, H5N1 has been detected in over 12 herds from six states – Texas, Kansas, Michigan, New Mexico, Idaho and Ohio.

In Texas, other animals in proximity to the affected farms – wild birds and cats – also showed signs of illness and have tested positive for the virus. The exact extent of the spread of H5N1 in cows has not yet been ascertained since cattle are not routinely tested for avian influenza and the symptoms have been relatively mild, leaving possibilities that there may be other undetected infected herds. The initial detections in late March in Texas, Kansas, and Michigan sion. Given the pace of the spread of infection across herds, the transmission of the virus within cattle has not yet been ruled out. Investigations are ongoing to determine the exact source of the spread to cows.

Genomic insights

In April 2024, a human infection of H5N1 was reported from Texas. The infected individual had contact with cows presumed to be infected with the virus. Fortunately, the patient had mild illness, with symptoms like eye redness, and has recovered after being treated with antivirals. Following this case, the CDC has reiterated that the risk of infections for humans remains low, although people with pro- such as farm workers, are at a higher risk. This is the second case of human H5N1 infection reported from the U.S. A previous case was reported in 2022 from Colorado. Human H5N1 infections are rare but have been sporadically reported in several countries.

H5N1 infections in humans can range from mild symptoms of eye infections to severe illness including pneumonia and death. Since 2003, more than 800 sporadic human H5N1 cases have been reported to the World Health Organization from over 20 countries, with a case-fatality ratio of 53%. In January 2024, concerns about H5N1 avian influenza rose in Southeast Asia when ly one resulting in death.

Researchers sequenced the H5N1 virus from both the infected Texas cows and the human case and found that both viruses belonged to clade 2.3.4.4b of H5N1, with the human strain having one minor mutation potentially linked to adaptation in mammals. However, this change has not led to increased transmissibility among humans, and the overall public health risk remains low according to the CDC. Since late 2021, H5N1 clade 2.3.4.4b has circulated in wild birds in the U.S.

Globally, 2023 also saw potential spillover events with H5N1 linked to the deaths of seals in Russia and infections in marine mammals in Peru. Early in 2023, dead seals in Russia and infected marine mammals in Peru suggested H5N1 might jump from birds to mammals. Additionally, the U.K. reported deaths of other animals including otters and foxes due to H5N1. These incidents underscore the need for further research to understand how H5N1 might evolve and potentially adapt to different species.

In summary, while the current risk of H5N1 transmission to humans is considered low, a combined approach of disease surveillance and monitoring the virus's genetic makeup (genomic surveillance) will be crucial for managing the outbreak.

(Bani Jolly is a senior scientist at Karkinos Healthcare and Vinod Scaria is a senior

- En masse deaths of a penguin species was reported on the remote southern continent of Antarctica.
- H5N1 influenza cases were first reported in South America in 2022, and have spread aggressively among wildlife species.
- The disease subsequently made its way to Antarctica.

H5N1

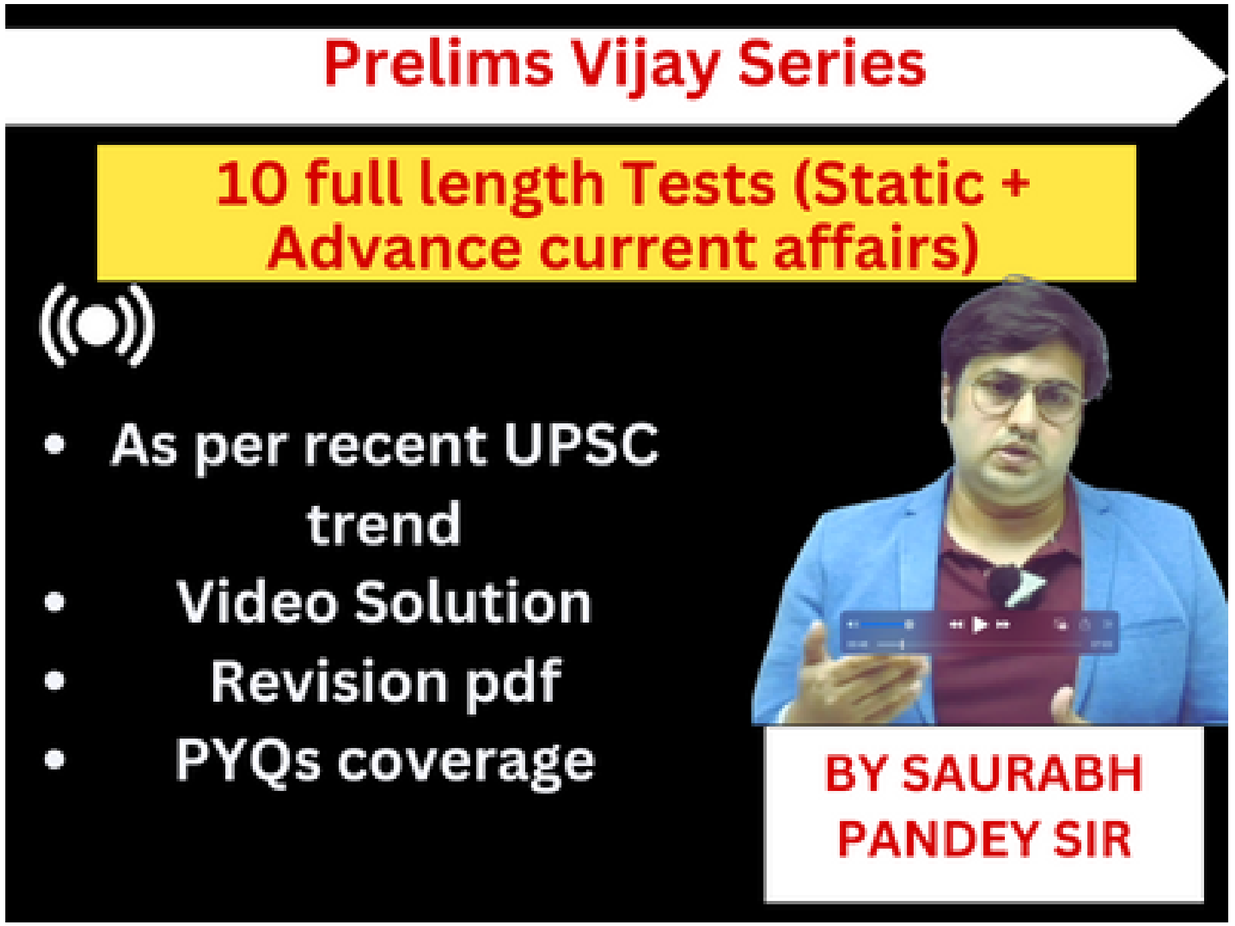
- H5N1 is primarily spread by poultry, but it can also infect humans and other mammals, which could be dangerous for the general public's health.
- Direct contact with infected birds or their droppings, as well as contaminated surfaces or settings, are the ways in which the virus is spread
- Influenza type A subtype H5N1 can cause an illness known as ‘avian influenza’ or ‘bird ’flu’ in birds, humans and many other animal species.
- HPAI A(H5N1) – ‘highly pathogenic avian influenza virus of type A of subtype H5N1’ – is the causative agent and is enzootic in many bird populations,

33 PER OFF IN ALL COURSES
LINK IN DESCRIPTION BOX

For any query msg-
9057921649

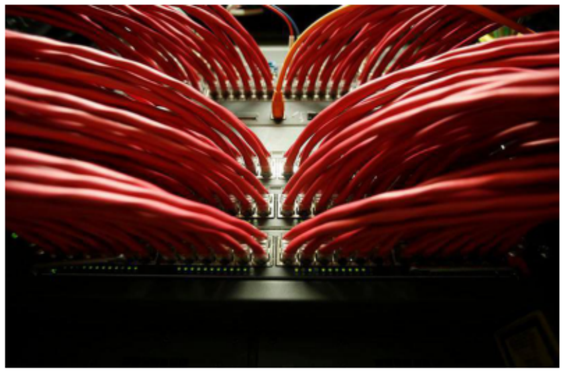
Must courses for upsc prelims 2023

For any query msg- 9057921649



Link in description

The Hindu analysis by saurabh pandey sir



Fiber coupled to the body enables textile electronics

A flexible electronic fiber that utilises the human body as part of the circuit enables textile-based electronics without the need for batteries or chips, a study report. According to the researchers, the approach is well-suited for scalable manufacture of comfortable fiber-based electronics for a wide range of applications, including “smart” clothing. The soft, thin fiber that enables wireless visual-digital interactions utilises the human body as part of the circuit. The approach harvests electromagnetic energy.

Electronic Fibre

- A Flexible electronic FIber that utilises the human body as part of the circuit enables textile-based electronics without the need for batteries or chips, a study report.
- According to the researchers, the approach is well-suited for scalable manufacture of comfortable FIber-based electronics for a wide range of applications, including “smart” clothing.
- The soft, thin FIber that enables wireless visual-digital interactions utilises the human body as part of the circuit.
- The approach harvests electromagnetic energy.

The Hindu analysis by saurabh pandey sir

Antibody therapy protects large animals from Nipah

Scientists have developed a potent antibody treatment that can protect large and small animals from infections with the Nipah virus, a deadly emerging pathogen with mortality rates as high as 40% to 90% in humans. The antibody treatment named hu1F5 targets the prefusion form of the Nipah virus F protein. In hamsters, the researchers found that administering the antibody one day after infection led to a 100% survival rate. It protected macaques.

hu1F5

- Scientists have developed a potent antibody treatment that can protect large and small animals from infections with the Nipah virus, a deadly emerging pathogen with mortality rates as high as 40% to 90% in humans.
- The antibody treatment named hu1F5 targets the prefusion form of the Nipah virus F protein.
- In hamsters, the researchers found that administering the antibody one day after infection led to a 100% survival rate. It protected macaques.

What is Nipah virus?

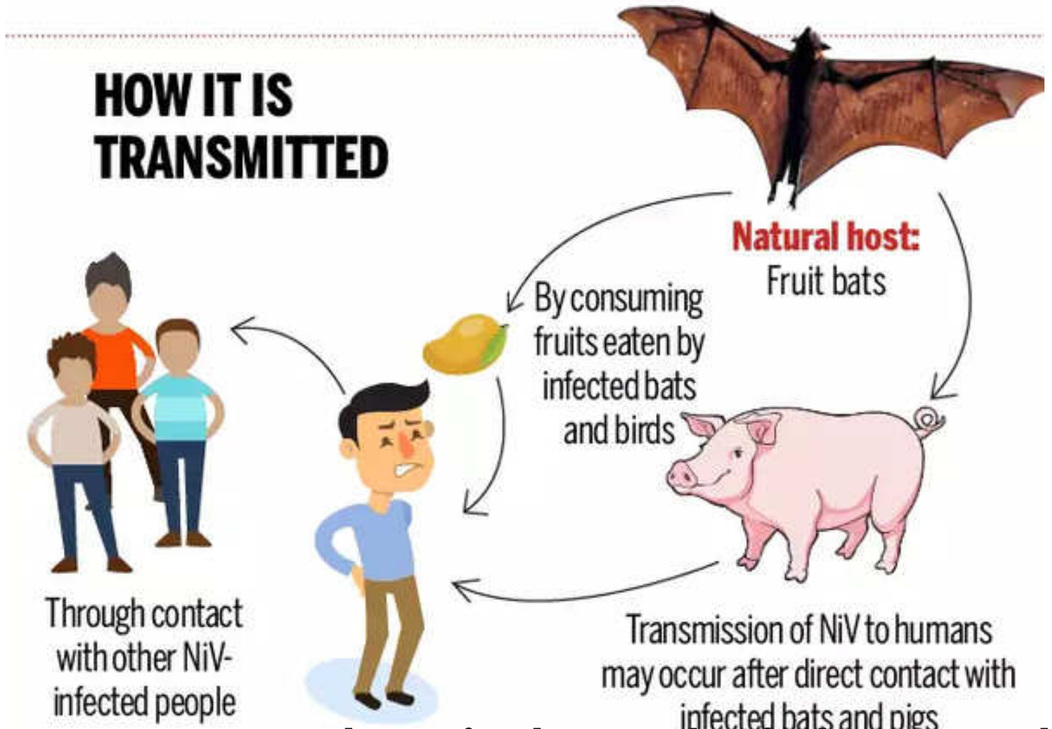
TOI

NIPAH VIRUS (NiV) INFECTION IS A NEWLY EMERGING ZOONOSIS THAT CAUSES SEVERE DISEASE IN BOTH ANIMALS AND HUMANS

NiV first identified in 1998 during an outbreak in Malaysia

Fruit bats are natural hosts of NiV

HOW IT IS TRANSMITTED



The Hindu analysis by saurabh pandey sir

Over-reliance on smear microscopy for TB detection

R. Prasad

The presumptive TB testing rate in the country increased from 1,352 per lakh population in 2022 to 1,710 per lakh population in 2023. However, even two years before the 2025 deadline that the government has set to "eliminate" TB in India, only 21% of presumptive TB testing in 2023 was upfront done using a rapid molecular diagnostic test.

According to the India TB Report 2024, which is yet to be made public, at 79%, the vast majority of presumptive TB testing was still carried out using the 100-year old sputum smear microscopy, which has low sensitivity. Ironically, compared with 2022, there has actually been a marginal decrease – from 23% to 21% – in the percentage of presumptive TB testing offered upfront using a molecular test in 2023.

The number of molecular testing facilities in the country has increased from 5,090 in 2022 to 6,496 in 2023. Also, there was a small increase in the rate of molecular testing in 2023 compared with 2022; the number of rapid molecular tests offered for presumptive TB testing increased from 292.7 per lakh population in 2022 to 358 per lakh population in 2023.

However, this has not been reflected in an increase in the proportion of molecular testing last year compared with 2022. India has still a long way to go before it reaches the goal of offering a molecular test upfront to all presumptive TB patients, with nil reliance on smear microscopy.

Grim choices: The proportion of molecular testing in 2023 has not increased compared with 2022.

In 2023, 37.19 lakh patients were offered a CBNAAT test, of which 7.4 lakh people were diagnosed with TB, representing a yield of 20%. In the case of TrueNat, of the 31.13 lakh patients who were tested using TrueNat, 3.3 lakh persons were diagnosed with TB, representing a yield of 11%. For smear microscopy, of the 1.89 crore persons tested, only 5.78 lakh were diagnosed with TB, representing a yield of just 3%.

Smear microscopy

The National Strategic Plan 2017-2025 wanted to reduce the number of presumptive TB patients who are offered sputum smear microscopy from over 9.1 million in 2015 to 5.1 million in 2023 while increasing the number of molecular tests from 40,000 in 2015 to over 14.7 million in 2023. However, as per the India TB report, in 2023, India was far from reaching the ambitious target set by NSP 2017-2025. The overreliance on smear microscopy has continued in 2023 with 79% of presumptive TB cases detected using smear microscopy and just 21% cases detected using a molecular test.

The revised National Strategic Plan 2020-2025 has raised the bar even higher for precision tests to be used for initial diagnosis.

Four years after the launch of the revised NSP, India is nowhere near meeting the targets. One of the main objectives of the revised NSP 2020-2025 is the early detection of presumptive TB cases.

It clearly says there should be "prompt diagnosis" using highly sensitive diagnostic tests for detecting presumptive TB cases "at the first point of contact" both in the private and public sectors.

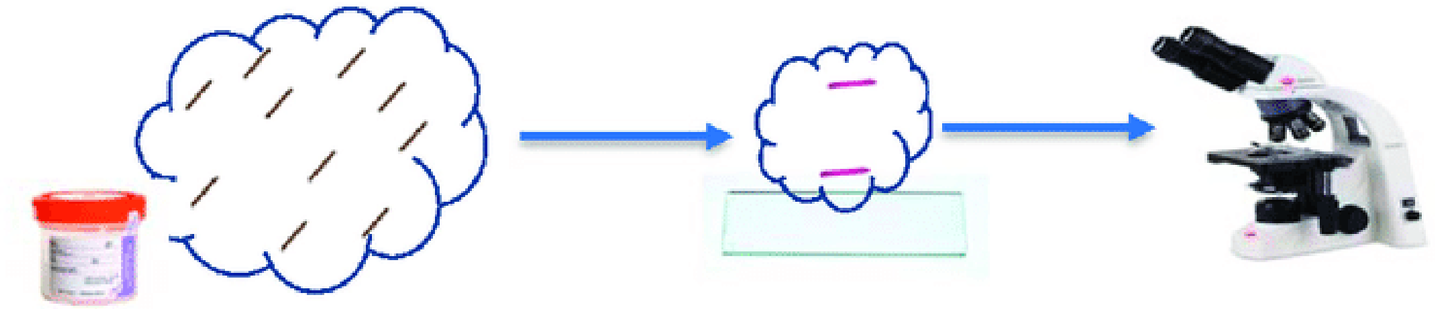
Universal drug-susceptibility testing in all drug-sensitive TB cases is crucial for early identification of drug-resistant TB. The revised NSP 2020-2025 clearly states that NTEP should provide "universal access" to drug resistance testing.

However, in 2023, the proportion of notified TB patients offered drug-susceptibility testing was just 58% as against the target of 98%. In the absence of drug-susceptibility testing, it is not possible to ascertain drug-resistant cases and offer them suitable MDR-TB medicines.

SMEAR MICROSCOPY

- Smear Microscopy: Microscopic. examination of specially stained smears to. detect acid-fast organisms such as.
- Mycobacterium tuberculosis and non- tuberculous mycobacteria (NTM)

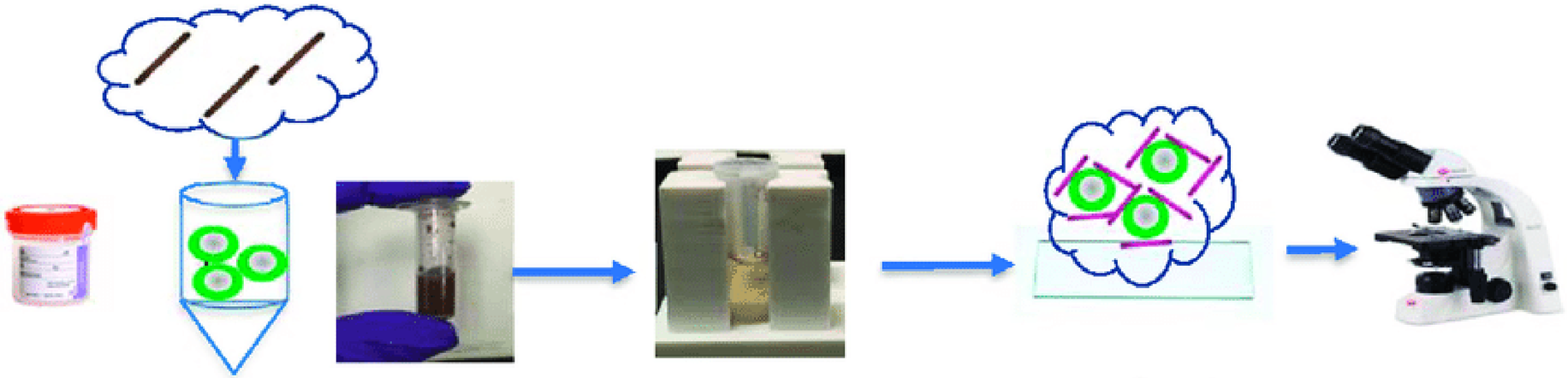
Conventional AFB Smear Microscopy (SSM)



Place sputum on slide and stain

Read and count AFB

Nanoparticle-based Colorimetric Biosensing Assay (NCBA)



Step 1

Add sputum to GMNP tube, shake, let stand 5 min

Step 2

Place tube on magnetic rack, remove supernatant

Step 3

Place GMNP-AFB on slide and stain

Read and count AFB

The Hindu analysis by saurabh pandey sir

Will new solar power rules boost production?

What is the Approved Models and Manufacturers of Solar Photovoltaic Modules Order?

Jacob Koshy

The story so far:

To incentivise India's solar module manufacturing industry, the Ministry of New and Renewable Energy (MNRE) has brought into effect from April 1 an executive order, The Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirements for Compulsory Registration) Order, 2019.

What is the context of the executive order?

This order was first issued by the MNRE in 2019 and requires makers of solar modules to voluntarily submit to an inspection of their manufacturing facilities by the National Institute of Solar Energy, a Ministry-affiliated body. Being on the list as an 'approved' manufacturing facility certifies a company as a legitimate manufacturer of solar panels and not a mere importer or assembler. This became necessary because India's solar industry, its claim of indigenousness notwithstanding, is heavily reliant on imports of cheaper and comparable-quality solar modules from China.

Modules are multiple solar panels joined together. Solar panels are an assembly of solar cells. Despite being among the top manufacturers in the world and a commitment to scale solar installation four-fold by 2030, local production of these cells and modules is much below demand. India also has limited capacity to make the raw material of a cell -- ingots, wafers – and is dependent on imported cells.

> The creation of a domestic list of manufacturers is also aimed at restricting imports from China, which controls nearly 80% of the global supply of solar modules

Why is India reliant on imports?

The creation of such a list was also aimed at restricting imports from China, which controls nearly 80% of the global supply, with the downturn in diplomatic relations between the countries also being a factor. India has ambitious plans of sourcing about 500 GW, nearly half its requirement of electricity, from non-fossil fuel sources by 2030. This would mean at least 280 GW from solar power by that year or at least 40 GW of solar capacity being annually added until 2030. In the last five years, this has barely crossed 13 GW though the government has claimed that COVID-19 affected this trajectory. The difficulty is that meeting the targets require many more solar panels and component cells than India's domestic industry can supply.

If the list is voluntary why pay to be on it?

The major advantage of being on the list is eligibility to compete for tenders issued by the government for its flagship solar energy programmes. This includes among others the recently announced PM Surya Ghar Muft Bijli Yojana. The scheme envisages subsidising rooftop solar installations for nearly one crore households in the country involving an estimated subsidy of ₹75,000 crore. However, only domestic manufacturers, certified as part of the Approved Models and Manufacturers (AMM) list, would be eligible. There is also another scheme called the PM KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan) that aims to provide solar pumpsets and rural electrification. For manufacturers to be eligible to provide components under this scheme, they have to be certified as genuine local manufacturers. The government also has a ₹24,000 crore scheme, called the Production Linked Incentive Scheme, that is targetted at incentivising domestic manufacture of solar panels and their components. Eligibility for this scheme too requires one to be a bona fide local manufacturer. So far, 14 major companies have become eligible for incentives to manufacture solar modules worth 48 GW. However, these restrictions apply only to fresh projects and plants and facilities commissioned before March 2024 can rely on imported modules.

Is India's manufacturing capacity adequate?

Last year was a fortunate year for Indians in the solar business. China which supplies over 80% of solar components globally saw a curb in orders from the U.S. on the grounds that the former relied on "forced labour" by Uyghur Muslims in the Xinjiang province. Europe too scaled back imports from China and a beneficiary of this was India which exported nearly $1 billion worth of modules in six months of 2023-24. However, reports suggest that the U.S. might roll back duties on China and this could again mean uncertainty for the future of Indian exports. It is estimated that nearly half of India's solar modules are imported from China and the demand-supply mismatch is expected to persist. The government, however, has claimed that beginning this year, there will be a significant rise in manufacturing capacity. While the list of certified manufacturers on the AMM list has grown to 82 according to the MNRE, there is yet no list of such manufacturers of solar cells, implying that India is still far away from achieving a comfortable degree of self-reliance.

New solar power rules

- T o incentivise India’s solar module manufacturing industry, the Ministry of New and Renewable Energy (MNRE) has brought into effect from April 1 an executive order, The Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirements for Compulsory Registration) Order, 2019.

The Hindu analysis by saurabh pandey sir

What is the context of the executive order?

- Being on the list as an ‘approved’ manufacturing facility certifies a company as a legitimate manufacturer of solar panels and not a mere importer or assembler.
- This became necessary because India’s solar industry, its claim of indigenousness notwithstanding, is heavily reliant on imports of cheaper and comparable-quality solar modules from China.
- Modules are multiple solar panels joined together. Solar panels are an assembly of solar cells.
- Despite being among the top manufacturers in the world and a commitment to scale solar installation four-fold by 2030, local production of these cells and modules is much below demand. India also has limited capacity to make the raw material of a cell — ingots, wafers — and is dependent on imported cells.

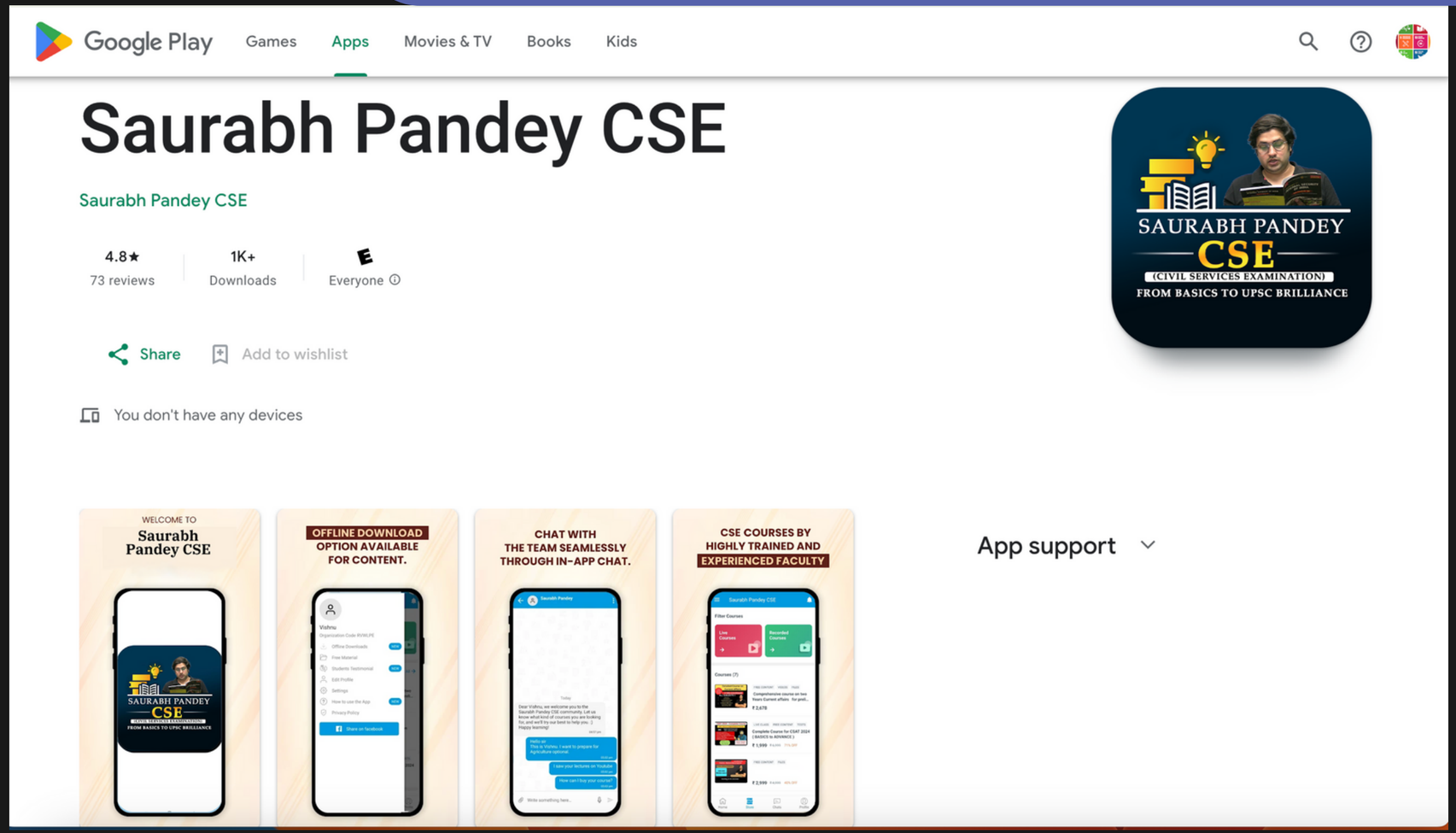
What is the context of the executive order?

- Why is India reliant on imports?
- The creation of such a list was also aimed at restricting imports from China, which controls nearly 80% of the global supply, with the downturn in diplomatic relations between the countries also being a factor.
- India has ambitious plans of sourcing about 500 GW, nearly half its requirement of electricity, from non-fossil fuel sources by 2030.
- This would mean at least 280 GW from solar power by that year or at least 40 GW of solar capacity being annually added until 2030.
- In the last FIve years, this has barely crossed 13 GW though the government has claimed that COVID-19 a□ected this trajectory.

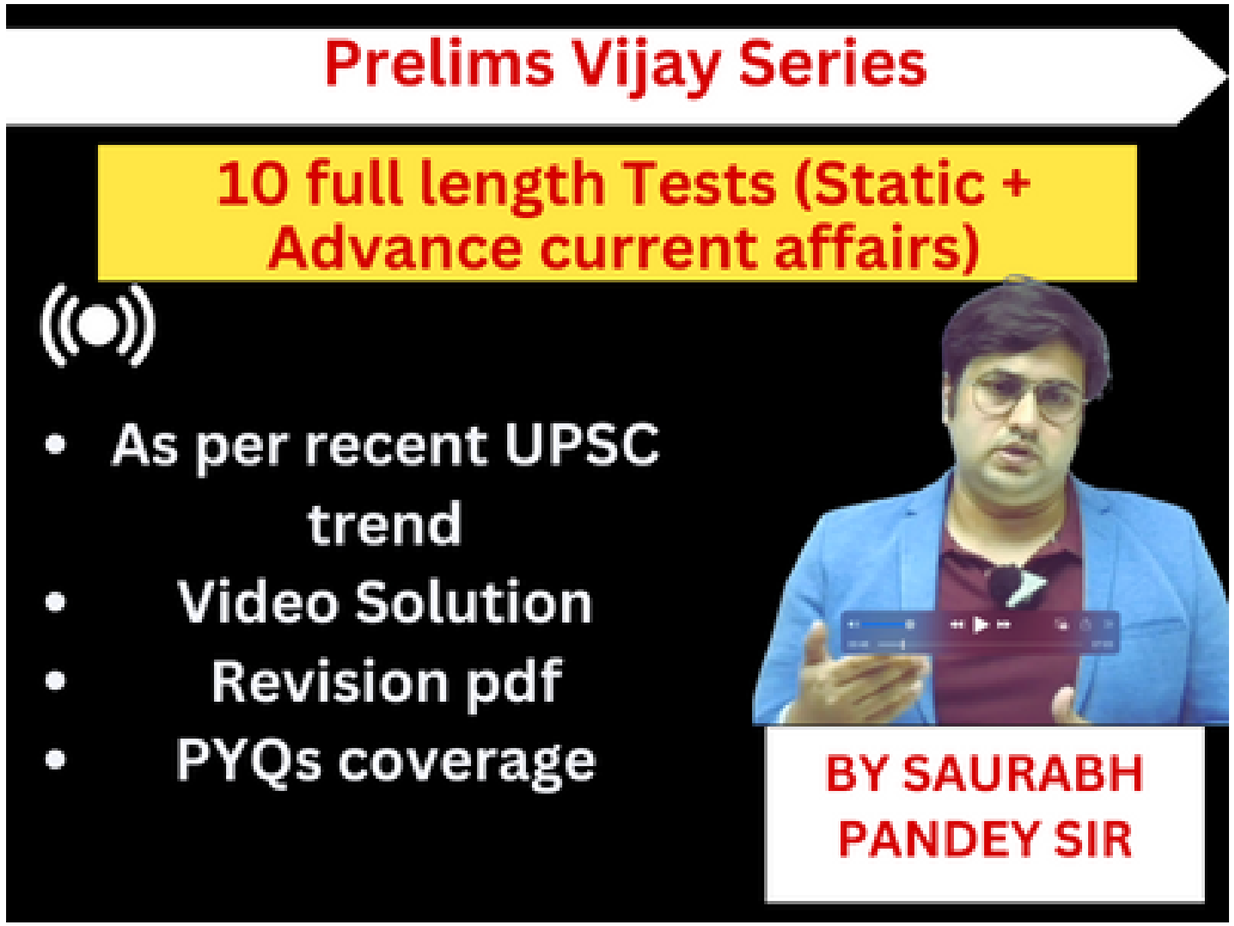
33 PER OFF IN ALL COURSES
LINK IN DESCRIPTION BOX

For any query msg-
9057921649

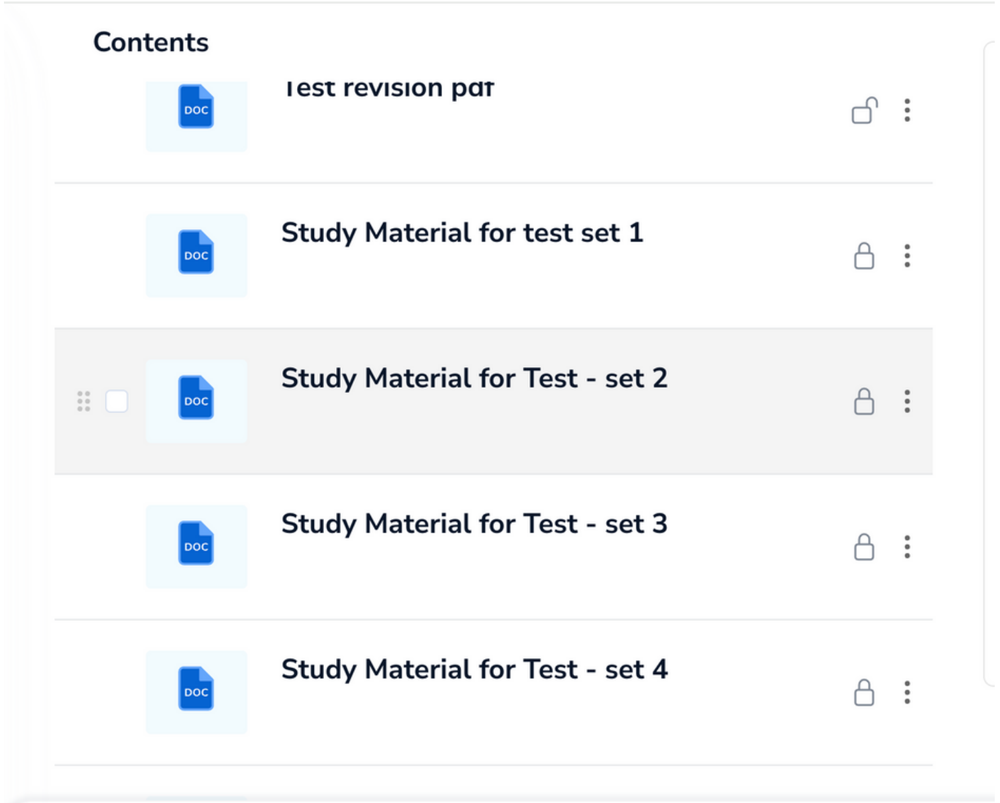
DOWNLOAD APP



Must courses for upsc prelims 2023



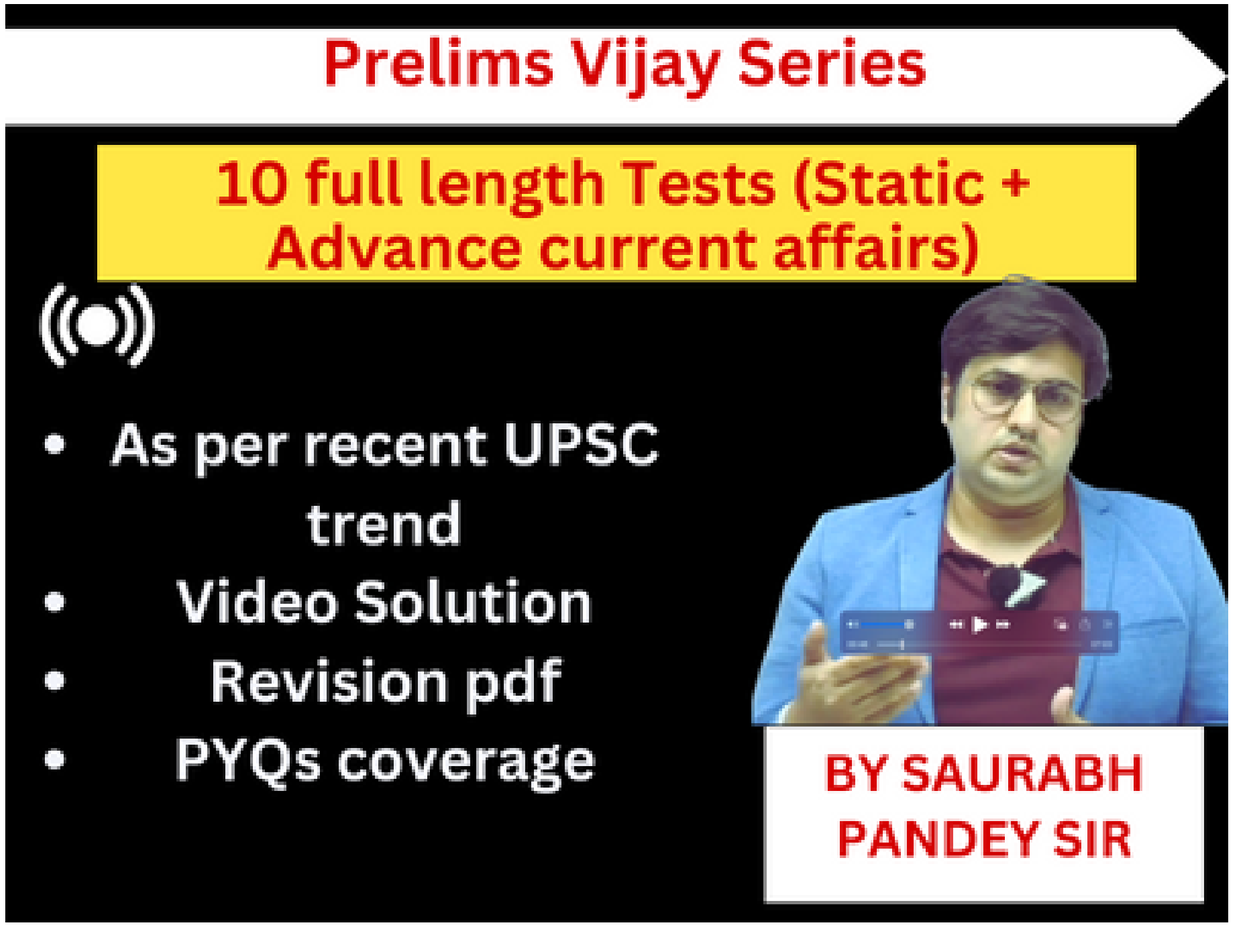
For any query msg- 9057921649



The Hindu analysis by saurabh pandey sir

Must courses for upsc prelims 2023

For any query msg- 9057921649



Link in description

The Hindu analysis by saurabh pandey sir