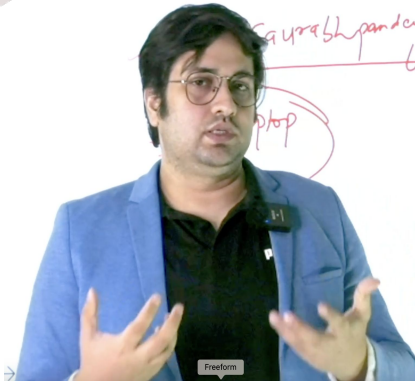
Topics - MINDS MAPS included (Daily current affairs 23rd January 2025

- Target UPSC CSE Prelims 2025
- The National Health Mission (NHM)’
- Discovering LID-568:
- China’s Export Control List:
- : U.S. Regulations on AI Chips and Technology
- Maharashtra FDA Directive on Homeopathic Practitioners
- Income Tax Department's New Guidance on Principal Purpose Test
- Chrea Mountain:
- Mains



By saurabh Pandey

THE HINDU

Target Mains -2025/26 -

Q ‘’.Now more than physical infrastructure , digital infrastructure and AI Infrastructure will decide economic growth of country ‘’ Examine

Q. How many of the given countries border along the Gulf of Aden. (The Hindu)

1) Saudi Arabia

2) Yemen

3) Somalia

4) Eritrea

5) Djibouti

Select the correct code.

A) Only two

B) Only three

C) Only four

D) All five

Schedule CRASH COURSE ON UPSC CSE Prelims 2025

Upcoming week, 20th to 25th January (Time: 9 PM)

Monday	20th January 2025	Basics of International Relations Class 2
Wednesday	22nd January 2025	Indian GEOGRAPHY old ncert-Class XI
Friday	24rth January 2025	Basics of International Relations Class 3
Saturday	25th January 2025	Indian GEOGRAPHY old ncert-Class XI

Download the Saurabh Pandey CSE app

For any Query 9057921649—Only Message

COMPLETE CRASH COURSE ON UPSC CSE PRELIMS 2025

(SUCCESS Batch)

-->Complete coverage of all static subjects.
NCERTs + Mapping + Advance books + PYQS
--> Developing elimination Tricks.
2 yrs coverage of prelims specific current affairs

By saurabh pandey sir

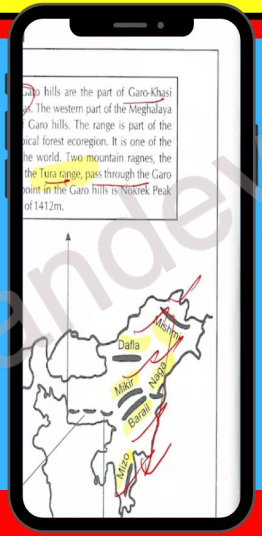
Download saurabh pandey cse app

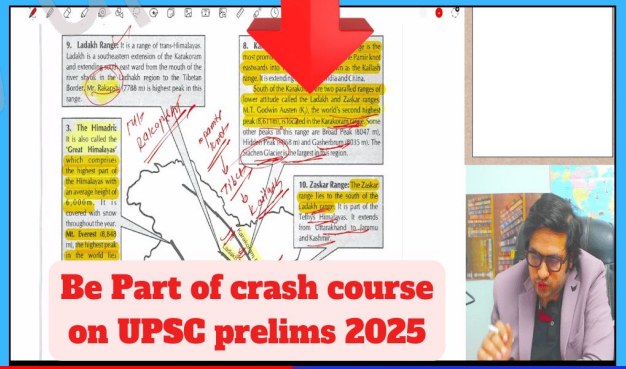
Visit - saurabhpandeyupsc.com

For Any Query Message
9057921649

EVERYTHING IN ONE COURSE !!

Are you missing These Mapping classes ??





Last year 50 + qs from sessions

Download - saurabh pandey cse app

For any query msg
9057921649

AAKLAN PLUS

Plz message - 9057921649

UPSC CSE MAINS 2025/26

Answer writing program

Syllabus (Qs Set 7-11)

Globalisation , society , IR , polity

Timing - QS Set upload - Saturday - 4pm

To join - download saurabh pandey cse app

National Health Mission has curbed several public health concerns, says Centre's report

Bindu Shajan Perappadan
NEW DELHI

The National Health Mission (NHM) has significantly contributed to improving India's public health, including lowering of the maternal mortality ratio, incidence of tuberculosis (TB), and sickle cell anaemia.

It has also contributed to expanding human resources in the field while fostering an integrated response to health emergencies, the Union government said on Wednesday in its assessment report (2021-24) presented to the Union Cabinet.

Listing out key achievements of the NHM in the past three years, the Centre noted that there had been a significant increase in human resources within the healthcare sector. "In FY 2021-22, NHM facilitated the engagement of 2.69 lakh additional healthcare workers, including general duty medical officers, specialists, staff nurses, AYUSH doctors, allied healthcare workers, and public health managers. Additionally, 90,740 community health officers (CHOs) were engaged. This number grew in subsequent years, with 4.21 lakh additional healthcare professionals engaged in FY 2022-23, including 1.29 lakh CHOs, and 5.23 lakh workers engaged in FY 2023-24, which included 1.38 lakh CHOs," the report stated.

With NHM, maternal mortality ratio has declined by 83% since 1990, which is higher than the global decline of 45%

It further noted that under NHM, the Maternal Mortality Ratio (MMR) has declined by 83% since 1990, which is higher than the global decline of 45%. Infant Mortality Rate (IMR) has fallen from 39 per 1,000 live births in 2014 to 28 in 2020.

Moreover, the Total Fertility Rate (TFR) decreased from 2.3 in 2015 to 2.0 in 2020, according to the National Family Health Survey (NFHS-5). These improvements indicate that India is on track to meet its U.N. Sustainable Development Goals (SDG) targets for maternal, child, and infant mortality well ahead of 2030. The NHM has also been instrumental in the elimination and control of various diseases, including the incidence of TB.

Topic → The National Health Mission (NHM)

The National Health Mission (NHM) has emerged as a cornerstone of India's public health strategy, aiming to address the myriad challenges facing the healthcare system. From 2021 to 2024, the NHM has made significant strides in enhancing maternal and child health, combating diseases like tuberculosis, and expanding the healthcare workforce.

Significant Achievements of NHM (2021-2024)

The NHM has been instrumental in achieving remarkable health outcomes over the past three years. Here are some key highlights:

Maternal Mortality Ratio (MMR): The MMR has seen a staggering decline of 83% since 1990, surpassing the global average of 45%. This achievement underscores the effectiveness of NHM's initiatives in maternal health.

- Infant Mortality Rate (IMR): From 39 per 1,000 live births in 2014, India has successfully reduced the IMR to 28 by 2020, reflecting improved healthcare access and quality.
- Healthcare Workforce Expansion: In FY 2021-22, NHM facilitated the engagement of 2.69 lakh additional healthcare workers, including general duty medical officers, specialists, and community health officers (CHOs). This number increased dramatically in subsequent years.

Control and Elimination of Diseases

The NHM has also played a vital role in disease control and elimination:

Tuberculosis (TB): The NHM's robust strategies have significantly reduced the incidence of TB. Public-private partnerships have been crucial in achieving a TB-free India, known as "TB Mukt Bharat."

Sickle Cell Anemia: Efforts to control sickle cell anemia have gained momentum, with increased awareness and screening programs.

Community Engagement: The NHM has fostered community involvement in health initiatives, enhancing disease awareness and prevention strategies.

Future Prospects and Goals

Looking ahead, the NHM aims to align its efforts with the U.N. Sustainable Development Goals:

Sustainable Development Goals (SDGs): The NHM is on track to meet its targets for maternal, child, and infant mortality well before 2030, showcasing India's commitment to global health standards.

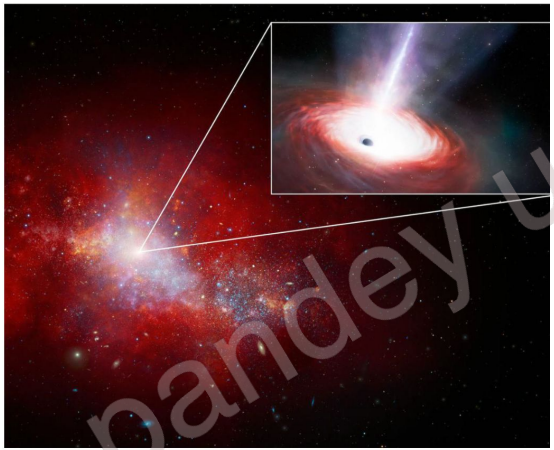
Public Health Infrastructure: Continuous improvements in public health infrastructure are essential for sustaining these gains. The NHM is focused on enhancing healthcare facilities and services across rural and urban areas.

Innovation and Technology: The integration of technology in healthcare delivery is a key focus, which will help streamline services and improve outcomes.

Space telescopes stumble on rule-breaking black hole

LID-568 is a low-mass supermassive black hole that existed just 1.5 billion years after the Big Bang. An analysis of its effects on its neighbourhood has indicated that it was feeding on a surrounding cloud of matter at almost 40 times greater than what astrophysicists thought was the upper limit

Shreejaya Karantha



An artist's concept of a red, early-universe dwarf galaxy that hosts the black hole LID-568 at its centre. While short-lived, this black hole's 'feast' could help astror explain how supermassive black holes grew so quickly in the early universe. NOIRLAB/NSF/AURA/J. DA SILVA/M. ZAMANI

An international team of researchers using NASA's James Webb Space Telescope (JWST) and the Chandra X-ray Observatory has discovered a bizarre black hole that may provide insights into the genesis and growth of supermassive black holes.

Supermassive black holes are among the most common types of black holes in the universe. Most galaxies contain a supermassive black hole at their centres. These black holes have masses ranging from millions to billions of times that of the sun. The supermassive black hole Sagittarius A*, located at the center of the Milky Way galaxy, has a mass of approximately 4.3 million solar masses.

However, scientists are not yet fully certain how these giants grow to become so big.

Beyond the upper limit

The newfound black hole, designated LID-568, is a low-mass supermassive black hole that existed just 1.5 billion years after the Big Bang. If the universe were a human, it could be said to be around eight years old at this time.

A detailed analysis of its effects on its neighbourhood indicated that the black hole was feeding on a surrounding cloud of matter at an exceptional rate – almost 40 times greater than what astrophysicists thought was the upper limit.

The study was led by International Gemini Observatory/NSF NOIRLab astronomer Hyewon Suh, and the results were published in the journal *Nature Astronomy* in November 2024.

"We first identified this unusual object through Chandra X-ray observations, as it was exceptionally bright in X-rays but completely invisible in the deepest optical and near-infrared observations, even with the Hubble Space Telescope," Suh, the lead researcher, said.

"Because it was only detected in X-rays, we couldn't determine its nature. With JWST's unparalleled sensitivity in the infrared, we were finally able to uncover this exotic object, highlighting the complementary power of these observatories," she added.

A class apart

The rate at which a black hole feeds on matter is governed by what astronomers call the Eddington limit. This limit – named after the English astronomer Arthur Stanley Eddington because he worked it out first – is also related to how brightly a black hole can shine.

Nothing can escape a black hole, of course. But when a black hole pulls surrounding matter towards itself, the infalling material becomes compressed, heats up, and emits radiation, especially X-rays.

The concept behind the Eddington limit is straightforward: as matter collects around the black hole and gets packed into the disc, it heats up and emits radiation that generates an outward pressure capable of counteracting the gravitational pull of the black hole. When this radiation pressure balances the force of gravity, the black hole will stop accruing the matter. Ergo, there is a limit on how brightly the black hole can shine.

If this limit is crossed, the scenario is called a super-Eddington accretion. This is the category in which LID-568 lies.

Suh said that they measured the total light coming from the black hole and its mass using observations from Chandra and JWST's Near-Infrared Spectrograph instrument, which revealed the exceptional accretion behavior of LID-568.

Experts have hypothesised that super-Eddington black holes can exist. They have even found a few. But LID-568 has defied their expectation in two ways. First, it's much, much farther away. The most distant of these other black holes is "only" around 2.3 billion light years from earth. Second, while the known rule-breakers exceeded the Eddington limit by a factor of two or three, LID-568 has done so by a factor of roughly 40, according to Suh.

Super-Eddington episodes in black holes are expected to be short-lived, so it is also remarkable that researchers captured LID-568 in action.

Making sense of the oddball

The existence of supermassive black holes that are millions or even billions of times more massive than our sun poses a challenge to current models of black hole formation and growth. Scientists have confirmed that such black holes reside at the centres of many galaxies that should have formed when the universe was less than a billion years old. However, they can't explain how these objects came to be when the universe was so young, when there shouldn't have been enough matter for them to form.

According to some traditional models, Suh said, "supermassive black holes are thought to form from the death of the first star, i.e., light seeds with 10-100 times the mass of the sun, and/or through the direct collapse of primordial gas clouds, such as heavy seeds with 1,000-100,000 times the mass of the sun."

"However, these models lack direct observational confirmation and require sustained, continuous accretion of large amounts of matter over several hundred million years to account for the most extreme supermassive black holes observed in the early universe, which is likely difficult," she added.

The discovery of LID-568 is crucial because it suggests that large black holes could have put on a significant fraction of their weight during short-lived episodes of rapid feeding. If true, this mechanism would do away with black holes having to feed on large quantities of matter for a very long time and offer "a convincing explanation for how supermassive black holes could form so quickly, regardless of their initial seed mass," whether heavy or light.

Chasing more black holes

Suh also said there are several theories to explain how black holes can exceed the Eddington limit, including geometrically thick accretion discs, powerful black hole jets, and black-hole mergers. However, she said that her team still doesn't fully understand the exact mechanism that allowed LID-568 to feed so fast and that follow-up observations with JWST will be crucial to admitting or eliminating other hypotheses.

The existence of supermassive black holes millions or even billions of times more massive than our sun poses a challenge to current models of black hole formation. Scientists can't explain how they came to be when the universe was so young, when there shouldn't have been enough matter for them to form

The researchers also found that the galaxy where LID-568 resided wasn't producing many new stars – the result of the black supermassive hole driving powerful streams of material outward from the centre, called outflows. These outflows could be preventing matter from accumulating in enough quantities to form stars.

To confirm this idea as well as to inform it with more data, Suh said she and her team are planning to examine similar galaxies and examine their outflows, especially those driven by very large black fast-snacking holes.

The research team is also planning to find out how long a black hole can accrue matter at a super-Eddington rate as well as what percentage of all black holes do so.

(Shreejaya Karantha is a freelance science writer and a content writer and research specialist at The Secrets of The Universe. shreejayakaranth@gmail.com)

Topic →Discovering LID-568: A Bizarre Black Hole Unveiled by NASA's JWST and Chandra X-ray Observatory

Well, an international team of researchers has just made a groundbreaking discovery that could change our understanding of the universe.

Using NASA's James Webb Space Telescope (JWST) and the Chandra X-ray Observatory, they've uncovered a bizarre black hole named LID-568.

Introduction to Supermassive Black Holes

So, what exactly are supermassive black holes? These cosmic giants are found at the centers of most galaxies, including our own Milky Way. They can have masses ranging from millions to billions of times that of our sun. For instance, Sagittarius A*, the supermassive black hole at the heart of the Milky Way, weighs in at about 4.3 million solar masses. But here's the kicker: scientists are still scratching their heads over how these colossal entities grow to such immense sizes.

What Are Supermassive Black Holes?

Supermassive black holes are not just big; they're essential to the structure and evolution of galaxies. They exert a gravitational pull that influences the motion of stars and gas in their vicinity. But how do they get so massive? That's the million-dollar question!

The Mystery of Their Growth

Traditional theories suggest that supermassive black holes form from the remnants of massive stars or through the collapse of gas clouds. However, these models struggle to explain how such massive black holes could exist in the early universe when there wasn’t enough matter available.

The Discovery of LID-568

Enter LID-568, a low-mass supermassive black hole that existed just 1.5 billion years after the Big Bang. If the universe were a human, it would be around eight years old at this time! This discovery was led by astronomer Hyewon Suh from the International Gemini Observatory, and the results were published in the journal Nature Astronomy in November 2024.

The Role of JWST and Chandra X-ray Observatory

The collaboration between these two observatories highlights the complementary power of modern astronomy. While Chandra detected the X-ray emissions, JWST provided the infrared data needed to understand LID-568's nature.

Understanding the Eddington Limit

Now, let's dive into the Eddington limit. This concept, named after astronomer Arthur Stanley Eddington, describes the maximum rate at which a black hole can accrete matter. It's all about balance: as matter falls into a black hole, it heats up and emits radiation, creating an outward pressure that can counteract gravity.

What is the Eddington Limit?

When the radiation pressure equals the gravitational pull, the black hole stops pulling in more matter. This is the Eddington limit, and crossing it leads to what's known as super-Eddington accretion.

Super-Eddington Accretion Explained

LID-568 is a prime example of super-Eddington accretion, feeding at a rate nearly 40 times greater than previously thought possible. This finding challenges existing theories and opens up new avenues for understanding black hole behavior.

LID-568: A Class Apart

What makes LID-568 so special? For starters, it’s much farther away than other known super-Eddington black holes. While the most distant ones are about 2.3 billion light-years from Earth, LID-568 is even more remote.

The Unusual Feeding Rate of LID-568

Moreover, while other super-Eddington black holes exceed the limit by a factor of two or three, LID-568 has done so by a staggering factor of roughly 40! This exceptional feeding rate is a remarkable find, as super-Eddington episodes are typically short-lived.

How LID-568 Defies Expectations

The discovery of LID-568 suggests that large black holes could gain significant mass during brief periods of rapid feeding, challenging the notion that they need to consume vast amounts of matter over extended periods.

Implications for Black Hole Formation

This finding has profound implications for our understanding of black hole formation. It suggests that supermassive black holes could form quickly, regardless of their initial seed mass.

Rethinking Black Hole Genesis

Traditional models propose that supermassive black holes arise from the death of massive stars or the collapse of primordial gas clouds. However, these models lack direct observational confirmation and require sustained accretion over hundreds of millions of years.

The Significance of Rapid Feeding Episodes

The discovery of LID-568 indicates that rapid feeding episodes could be a key mechanism in the formation of supermassive black holes, allowing them to grow much faster than previously thought.

The Quest for Understanding Outflows

Additionally, they found that the galaxy housing LID-568 isn’t producing many new stars, likely due to powerful outflows driven by the black hole. These outflows could be preventing the accumulation of matter necessary for star formation.

1. What is a supermassive black hole? Supermassive black holes are enormous black holes found at the centers of galaxies, with masses ranging from millions to billions of times that of the sun.

2. How was LID-568 discovered? LID-568 was discovered using NASA's JWST and Chandra X-ray Observatory, which revealed its unique properties through X-ray and infrared observations.

3. What is the Eddington limit? The Eddington limit is the maximum rate at which a black hole can accrete matter, determined by the balance between gravitational pull and radiation pressure.

4. Why is LID-568 significant? LID-568 is significant because it challenges existing theories of black hole growth and suggests that supermassive black holes can form rapidly through short-lived feeding episodes.

China's moves must recast India's critical minerals push

Rakshith Shetty

is a Research Analyst at the Takshashila Institution, Bengaluru

Pranay Kotasthane

is the Deputy Director at the Takshashila Institution, Bengaluru

On January 2, 2025, China's Ministry of Commerce (MOFCOM) expanded its export control list by including 28 entities from the United States, effectively restricting their access to a swath of items classified under dual-use export controls. At the core of these restrictions lies minerals and rare and refined materials that are vital for high-technology applications such as in aerospace, semiconductors, batteries, and advanced electronics. Beijing's list encompasses tungsten, gallium, magnesium, beryllium, hafnium, lithium-6 (isotope), and others – minerals with uses ranging from chip production to speciality alloys.

This is not the first time that China has weaponised the exports of its critical minerals. And it is an approach that is strategic and calculated. Beijing primarily targets minerals that are deemed to be critical by western nations and their allies, especially those essential for semiconductors, batteries, and high-tech manufacturing. However, China carefully balances these decisions against two constraining factors: it avoids controlling minerals which are heavily dependent on western raw material imports. And it refrains from actions that could disrupt its domestic industrial enterprises or export-dependent sectors. This strategic calculus was evident in China's rare earth minerals embargo against Japan in 2010, its recent restrictions on antimony, gallium, and germanium exports, and its ban, in December 2023, on rare earth extraction and processing technologies.

The situation in India

Meanwhile, policymakers in the United States and elsewhere are becoming increasingly concerned. These developments underscore a larger trend: the competition for critical minerals has become a fulcrum of international economic diplomacy. For nations such as India, these events are also a wake-up call – to improve domestic mineral exploration and production capacity.

India's push for critical minerals development has faced stubborn challenges. In 2023, lithium deposits that were found in Jammu and Kashmir's Reasi district made headlines, hinting at a game-changer moment for India's energy transition. However, a little over a year later, the story remains lacklustre: no company has shown interest in bidding for these resources, and the block remains in limbo. Unfortunately, this is not an isolated incident. Government data show that only 48% (24 out of 49) of the mineral blocks available for auction in recent years have been auctioned.

This lack of market enthusiasm cannot be pinned entirely on government negligence. Over the last three years, the Union government has introduced measures to spur activity in critical minerals. The Ministry of Mines identified 30 critical minerals that are deemed essential for national security. And before that, the Union government set up a designated body, Khanij Bidesh India Ltd. (KABIL), which has been tasked with obtaining overseas investments in critical minerals such as lithium and cobalt. Parliament passed the Mines and Minerals (Development and Regulation) Amendment Act, 2023, lifting restrictive classifications on some rare earth elements that used to be considered 'atomic minerals'. These reforms theoretically opened the door for greater private-sector investment and technology sharing.

India's critical minerals development plans face challenges; a way out may be to adopt the semiconductor fabrication model

Reforms and results

A key highlight of the 2023 amendments is the introduction of an 'exploration license', devised to attract specialised resource exploration agencies, including foreign companies, to survey potentially rich but geologically challenging deposits. Instead of having to commit to a full-scale mining operation that can take over a decade or more to turn profitable, these exploratory firms can now participate in reconnaissance and prospecting alone. The law also promises to reimburse 50% of the exploration expenditure once mining begins, aiming to de-risk early-stage operations.

Despite these promising reforms, the results have been tepid. Only a handful of exploration licences for minerals such as lithium, rare earth elements, and graphite have been cleared, and those mostly went to Indian public sector firms. Foreign participation is sparse, and further downstream, mining license auctions for critical minerals have largely stalled.

One explanation is that India's resource classification system is outdated, leaving miners unsure about the commercial viability of mineral blocks. Exploration levels – often categorised under international norms as G1, G2, G3, or G4 – require progressively detailed geological data on ore grade and quantity. Many auctioned blocks in India have yet to reach advanced exploration status, making them riskier to prospective bidders. That said, a more puzzling factor is the low demand for exploration licences themselves – an option that should, in principle, help de-risk investments but evidently has not had the intended effect.

Fiscal incentives may be essential

This brings us to the essential role of high-quality data. Exploration is at the heart of mitigating 'information asymmetry', where potential buyers (mining companies) and the seller (government) do not share a clear view of the resource's true value. Without robust geological surveys, many bidders discount their offers or abstain entirely. The result is suboptimal auctions, with some potentially valuable blocks simply overlooked.

A possible remedy is to offer larger upfront fiscal incentives during the exploration phase. In other words, the solution might be to approach critical minerals extraction as a semiconductor fabrication project. In chip manufacturing –another sector with enormous upfront costs and slow returns – India has taken an aggressive approach, pledging direct capital support early in the construction phase. A similar model could work for critical minerals, offsetting immediate exploration costs instead of reimbursing them only after production begins. Upfront capital support for exploration would resolve a market failure and help unlock value many times over in downstream mining, exploration, sales, and exports.

Topic → China's Export Control List: A New Chapter

On January 2, 2025, the landscape of international trade shifted dramatically as China's Ministry of Commerce (MOFCOM) unveiled its expanded export control list. This strategic move included 28 entities from the United States, effectively curtailing their access to critical minerals and refined materials pivotal for high-technology applications.

- The list targets essential elements such as tungsten, gallium, magnesium, beryllium, and lithium-6.
- These minerals are crucial for manufacturing aerospace components, semiconductors, and advanced electronics.

The Strategic Calculus Behind China's Restrictions

China’s export restrictions are not a new phenomenon; they reflect a long-standing strategy to maintain leverage over critical minerals. By targeting minerals that are essential to Western nations, Beijing aims to reinforce its position in high-tech manufacturing.

- Strategic targets include minerals critical for semiconductors and batteries.
- China’s moves are balanced against domestic industrial needs and its dependency on Western raw materials.
- Historical precedents, such as the 2010 rare earth embargo against Japan, illustrate this calculated game.

The Indian Response: A Wake-Up Call

As China tightens its grip on critical minerals, countries like India face pressing challenges in enhancing their own mineral exploration and production capabilities.

- India’s efforts to tap into lithium deposits have not garnered the expected interest from investors, with only 48% of available mineral blocks auctioned.
- Government initiatives, including the establishment of Khanij Bidesh India Ltd. (KABIL), aim to attract foreign investment in critical minerals.
- The Mines and Minerals (Development and Regulation) Amendment Act, 2023, is designed to facilitate private-sector investment and technology sharing.

The path forward for India in the realm of critical minerals hinges on robust fiscal incentives and high-quality geological data

The strategic importance of these resources cannot be overstated, as they are integral to innovations in various high-tech industries.

Global Supply Chain Disruptions: The restrictions could lead to significant delays and increases in costs for companies reliant on these minerals for production.

Geopolitical Tensions: Heightened competition for mineral resources may exacerbate existing geopolitical tensions, particularly between the U.S. and China.

Investment Opportunities: In the wake of these developments, nations are likely to ramp up investments in domestic mineral exploration and processing capabilities

Navigating the Future: Strategic Recommendations

In light of these developments, stakeholders across the globe must navigate this shifting landscape with strategic foresight.

Investment in R&D: Countries should prioritize research and development initiatives to discover alternative materials and improve recycling processes for critical minerals.

International Collaboration: Collaborative efforts between nations can help mitigate the risks associated with supply disruptions and foster a more resilient supply chain.

Policy Frameworks: Governments need to establish robust policies that encourage domestic exploration and the sustainable production of critical minerals.

The Role of Technology in Mineral Exploration

Advancements in technology play a pivotal role in enhancing mineral exploration efforts, making them more efficient and effective.

Geophysical Surveys: Utilization of advanced geophysical techniques can enhance the discovery of mineral deposits while minimizing environmental impacts.

Data Analytics: Employing big data and AI can provide valuable insights into mineral exploration, predicting potential sites based on geological data.

Sustainable Practices: Implementing sustainable practices in mining operations can reduce the ecological footprint and promote responsible resource management.

Addressing Environmental Concerns

As the demand for critical minerals escalates, it is imperative to address the environmental implications of mining activities.

Ecosystem Preservation: Implementing measures to protect local ecosystems is vital for sustainable mining practices.
Waste Management: Developing effective waste management strategies can mitigate the environmental impact associated with mining operations.
Community Engagement: Engaging local communities in the decision-making process ensures that their rights and concerns are taken into account.

The Global Race for Critical Minerals

The geopolitical landscape surrounding critical minerals is rapidly evolving, with nations vying for dominance in this essential sector.

Strategic Alliances: Countries are forming strategic alliances to secure supply chains. This has led to increased cooperation among nations rich in mineral resources.

Investment in Infrastructure: There is a growing need for investment in mining infrastructure to support the extraction and processing of critical minerals.

Market Diversification: As countries look to reduce dependence on a single supplier, diversifying sources of minerals will become a priority.

The Road Ahead: Strategic Recommendations and Conclusion

As we look toward the future, it is imperative for nations and industries to adopt a forward-thinking approach in the realm of critical minerals.

Investment in Exploration: Increased funding for exploration activities will be essential to uncover new mineral deposits.

Strengthening Regulations: Implementing clear regulations will enhance transparency and attract foreign investments.

Promoting Sustainability: Emphasizing sustainable practices in mining will ensure that environmental concerns are addressed, fostering a positive public perception.

What is U.S.'s new rule for exporting AI chips?

What is the main objective behind one of the last orders of the Biden administration? How will the tiered framework for licensing and exporting Artificial Intelligence chips work? How has the tech industry responded to the move? Will it affect India?

EXPLAINER

Saptaparno Ghosh

The story so far:

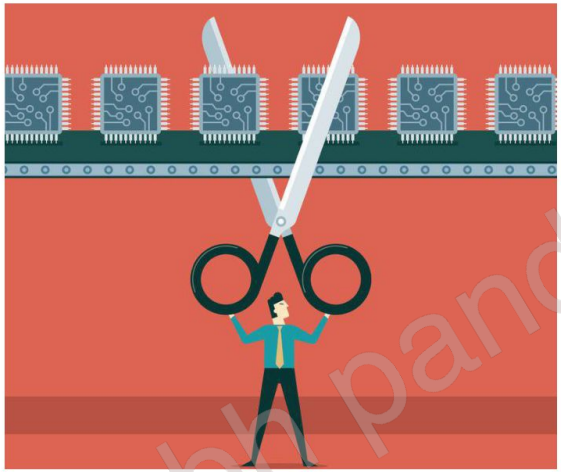
With an objective to advance increased control over circulation of Artificial Intelligence (AI) chips and technology, the U.S. Bureau of Industry and Security (BIS) introduced a tiered framework for licensing and exports. It held the regulations were in tandem with "national security and foreign policy interests". Further, it would help "cultivate a secure and trusted technology ecosystem for the responsible use and diffusion of AI".

What technology are we discussing?

Broadly, the regulation concerns advanced computing chips and certain closed AI model weights. AI models are software programs that comprise a series of mathematical operations. When data is entered into the program, it executes those operations on the entered data (provided by the user) to produce outputs which could be information, analysis or media. It is the design of these operations and their arrangement, known as the model architecture, that determines the nature and quality of the output.

What do the regulations propose?

The new regulations update existing rules for export, re-export and transfers (in-country) by segregating countries into three tiers – each harbouring different rules for licensing and authorisation. The first of these tiers entail no restrictions for the export, re-export or transfer of advanced computing chips to 18 U.S. allies and partners, including Australia, Belgium, Canada, South Korea, U.K. and Japan, among others. The second tier introduces caps on volume and exemptions based on specifications alongside mandatory authorisation and licensing. It holds that transactions that could contribute to the development of



GETTY IMAGES

advanced AI models would require a Validated End User (VEU) authorisation. Those that do not contribute to the development of advanced AI models, such as chips with a collective computation power of roughly 1,700 advanced GPUs, would not need an authorisation. China and India together have been categorised under this sub-head. The third tier includes arms-embargoed countries, such as North Korea, Iraq, Iran and Russia, among others. These countries will have no access to the technology.

Why has access been curtailed?

One of the main objectives has been to ensure that the technology (or equipment) do not reach the 'countries of concern' or U.S. adversaries. Furthermore, as detailed in the Federal Register, it strives to ensure that model weights are stored outside the U.S. "only under stringent security conditions" and that the large clusters of advanced integrated circuits (ICs) necessary to train those models are "built in destinations that pose comparatively low risks of diversion or misuse". The BIS determined that adversaries could potentially use the advanced AI systems to improve speed and accuracy of their military decision making, planning and logistics. BIS also observed that access to systems could potentially lower the barrier for non-experts to develop weapons of mass destruction, support offensive cyber operations and assist in human rights violations (such as through mass surveillance). Separately, it is essential to note that the BIS placed concerns about Chinese companies utilising "foreign subsidiaries in a range of uncontrolled destinations to buy ICs".

What are the concerns?

The primary concern relates to the threat to U.S.' global competitiveness in the realm. Ned Finkle, Vice President of Govt Affairs at NVIDIA – among the largest chip makers globally, wrote in a blogpost that it would undermine the innovation that has kept the U.S. ahead. Mr. Finkle argued that the rules would do nothing to enhance U.S. security. "The new rules would control technology worldwide, including technology that is already widely available in mainstream gaming PCs and consumer hardware."

Ken Glueck, Executive Vice President at Oracle, wrote in December 2024, that the rules assumed there were no other non-U.S. suppliers to procure GPU technology from. Explaining the aspect about competitiveness, the Oracle executive stated that by adding "more chips to the problem, you can keep playing the game". "If your alternate supplier has less performance, you can achieve parity by just adding more GPUs for the task. Enter Huawei and Tencent. Do it a cheaper price. Enter the CCP. And deploy it globally, enter Alibaba," he explained. The rules have been introduced less than a week before President-elect Donald Trump's return to the White House. The tech industry have pinned their hopes on the incoming administration to withdraw the framework.

Do these rules impact India?

According to Pranay Kotasthane, Chairperson at High Tech Geopolitics Programme at Takshashila Institution, big Indian data centres wanting to deploy advanced AI chips might need to apply for the VEU authorisation to speed things up. He observed that Indian companies acquiring the VEU authorisation can utilise the exported items for civilian and military purposes except for nuclear-end uses. "All in all, it does not seem to be a big deal. The bigger story is that India is not in the trusted allies and partners category, probably because of the leakages of chips to Russia," he said.

THE GIST

- The new regulations update existing rules for export, re-export and transfers (in-country) by segregating countries into three tiers — each harbouring different rules for licensing and authorisation.
- The primary concern relates to the threat to U.S.' global competitiveness in the realm. Ned Finkle, Vice President of Govt Affairs at NVIDIA, wrote in a blogpost that it would undermine the innovation that has kept the U.S. ahead.
- The tech industry have pinned their hopes on the incoming administration to withdraw the framework.

Topic → The Story So Far: U.S. Regulations on AI Chips and Technology

Introduction to AI Chip Regulations

In a world where technology is advancing at lightning speed, the U.S. Bureau of Industry and Security (BIS) has stepped in with a new set of regulations aimed at controlling the circulation of Artificial Intelligence (AI) chips and technology.

This move is not just about keeping up with the times; it's about safeguarding national security and foreign policy interests. But what does this mean for the tech landscape, and how will it affect various stakeholders?

What is the U.S. Bureau of Industry and Security (BIS)?

The BIS is a part of the U.S. Department of Commerce, and its primary role is to regulate the export of sensitive technologies.

By introducing a tiered framework for licensing and exports, the BIS aims to create a secure and trusted technology ecosystem for the responsible use and diffusion of AI.

The Objective Behind the Regulations

The BIS believes that these regulations will help cultivate a secure environment for AI technology, ensuring that it is used responsibly and does not fall into the wrong hands. The overarching goal is to prevent adversaries from gaining access to advanced AI systems that could enhance their military capabilities or contribute to human rights violations.

Understanding the Technology Involved

What Are Advanced Computing Chips?

At the heart of these regulations are advanced computing chips, which are essential for running complex AI models. These chips perform a series of mathematical operations that allow AI systems to process data and generate outputs, whether that be information, analysis, or even media.

The Role of AI Model Weights

AI models are essentially software programs that rely on a specific architecture to function. The arrangement of these mathematical operations, known as model architecture, determines the quality of the output. The regulations also cover certain closed AI model weights, which are crucial for the performance of these models.

The New Tiered Framework Explained

Overview of the Three Tiers

The BIS has categorized countries into three tiers, each with different rules for licensing and authorization regarding AI technology.

Tier 1: No Restrictions for Allies

The first tier includes 18 U.S. allies and partners, such as Australia, Canada, and the U.K. These countries face no restrictions when it comes to exporting or transferring advanced computing chips.

Tier 2: Conditional Licensing for Others

The second tier introduces caps on volume and requires mandatory authorization for transactions that could contribute to the development of advanced AI models. Countries like China and India fall into this category, where certain transactions will require a Validated End User (VEU) authorization.

Tier 3: Complete Ban for Adversaries

The third tier includes countries under arms embargoes, such as North Korea and Iran. These nations will have no access to advanced AI technology, reflecting the U.S. stance on national security.

Why Access to AI Technology is Restricted

National Security Concerns

The primary reason for these restrictions is to prevent technology from reaching countries deemed as adversaries. The BIS aims to ensure that advanced AI systems do not enhance the military capabilities of these nations.

Risks of Misuse and Diversion

The BIS has also expressed concerns about the potential misuse of AI technology. They fear that adversaries could use these systems for offensive cyber operations or even to develop weapons of mass destruction.

Industry Concerns and Reactions

Impact on U.S. Competitiveness

One of the most significant concerns raised by industry leaders is the potential threat to U.S. global competitiveness. Critics argue that these regulations could stifle innovation and hinder the U.S.'s ability to lead in the tech space.

Perspectives from Industry Leaders

Ned Finkle from NVIDIA and Ken Glueck from Oracle have voiced their apprehensions, suggesting that the rules may not enhance U.S. security and could inadvertently empower non-U.S. suppliers to fill the gap left by these restrictions.

Implications for India

The Need for Validated End User (VEU) Authorization

For Indian companies looking to deploy advanced AI chips, the new regulations mean they may need to apply for VEU authorization. This could slow down the process of acquiring necessary technology, but it’s not seen as a major hurdle.

FAQs

What are AI chips?

AI chips are advanced computing chips designed to run complex AI models and perform mathematical operations on data.

Why did the U.S. introduce these regulations?

The regulations aim to protect national security and prevent advanced AI technology from reaching adversaries.

What is the tiered framework?

The tiered framework categorizes countries into three tiers, each with different rules for licensing and authorization regarding AI technology.

How do these regulations affect India?

Indian companies may need to apply for VEU authorization to acquire advanced AI chips, which could slow down their deployment.

What are the concerns raised by industry leaders?

Industry leaders worry that these regulations could undermine U.S. competitiveness and stifle innovation in the tech sector

Is the government encouraging 'crosspathy'?

Why did the Maharashtra Food and Drugs Administration issue a directive allowing homeopathic practitioners to prescribe allopathic medicines?

Zubeda Hamid

The story so far:

The Maharashtra Food and Drugs Administration has, in a recent directive, allowed homeopathic practitioners, who have completed a certificate course in modern pharmacology, to prescribe allopathic medications.

Why is it being challenged?

In 2017, the Maharashtra Medical Education and Drug Department had issued a notification allowing homeopathic practitioners to practise modern medicine. As per this notification, doctors who had obtained the Licentiate of the Court of Examiners of Homeopathy degree from 1951-1982 (the degree was abolished in 1982), and were registered with the Maharashtra Medical Council, were allowed to practise modern medicine. This directive was challenged in the Bombay High Court by the Indian Medical Association (IMA). The High Court issued a stay, with the Bench questioning the risk that could be posed to patients if these doctors were allowed to practise allopathy.

IMA Maharashtra president Santosh Kadam said it was unclear why the Maharashtra FDA had now issued this directive. He said that even the central body for homeopathy had no provision to allow its practitioners to practise another stream of medicine and that 'crosspathy' was banned by the Supreme Court. Following the Bombay High Court stay, homeopathic practitioners were not allowed to prescribe allopathic medication, until the final decision of the court came in, he said.

Former secretary of the IMA, Maharashtra, Parthiv Sanghvi, pointed out that the issue has been portrayed as the Maharashtra government allowing homeopathic practitioners to practise modern medicine – which is not the case, as this has already been stayed by the High Court. "This was a direction to chemists to entertain allopathic prescriptions of homeopathic practitioners. But who has given the FDA the authority to issue such a directive, in light of the fact that court has stayed the order allowing homeopathic practitioners to practise modern medicine," he asked.

What is SC's stance on 'crosspathy'?

In 1996, in *Poonam Verma versus Ashwin Patel and Others*, which involved a homeopath treating a patient with allopathic medications and the patient subsequently dying, the Supreme Court held the homeopath liable for negligence as he had prescribed medications that he was not qualified to. A 2015 research paper by Suresh Bada Math et al states: "Across judgments, the judiciary has held that cross-system practice is a form of medical negligence; however, it is permitted only in those states where the concerned governments have authorised it by a general or special order."

Is there a shortage of doctors?

The Central government has been promoting AYUSH medicine for some years now, with a push being given to integrative/integrated medicine. The rationale, in general, has been that India has a shortage of doctors, particularly in rural areas, and that the AYUSH cadre of practitioners can help fill in these gaps.

As per a Parliament statement in February 2024, there are 13,08,009 allopathic doctors registered with the State medical councils and the National Medical Commission as on June 2022, and 5.65 lakh AYUSH doctors. The shortage of specialists is dire – the Health Dynamics of India 2022-23 report reveals a nearly 80% shortage of specialist doctors in community health centres across rural India. Public health specialist Soham Bhaduri pointed out that while there is evidence that mid-level providers can provide care of comparable quality to that of medical doctors, their orderly integration into the system is crucial. "Allowing just any cadre of alternative medical practitioners to assume roles and functions that are meant for medical doctors is a recipe for anarchy."

THE GIST

- In 2017, the Maharashtra Medical Education and Drug Department had issued a notification allowing homeopathic practitioners to practise modern medicine. This directive was challenged in the Bombay High Court by the Indian Medical Association.
- The Central government has been promoting AYUSH medicine for some years now, with a push being given to integrative/integrated medicine.
- The rationale, in general, has been that India has a shortage of doctors, particularly in rural areas, and that the AYUSH cadre of practitioners can help fill in these gaps.

Topic → Maharashtra FDA Directive on Homeopathic Practitioners

Overview

🏥 The Maharashtra FDA has permitted homeopathic practitioners with a pharmacology certificate to prescribe allopathic medications.

⚖️ This directive is under legal scrutiny due to a previous Bombay High Court stay on a similar notification.

📜 The Indian Medical Association (IMA) contends that the directive contradicts the Supreme Court's ban on 'crosspathy' and lacks legal authority.

⚠️ The Supreme Court has previously held a homeopath liable for negligence when using allopathic treatments, highlighting the risks of cross-system practice.

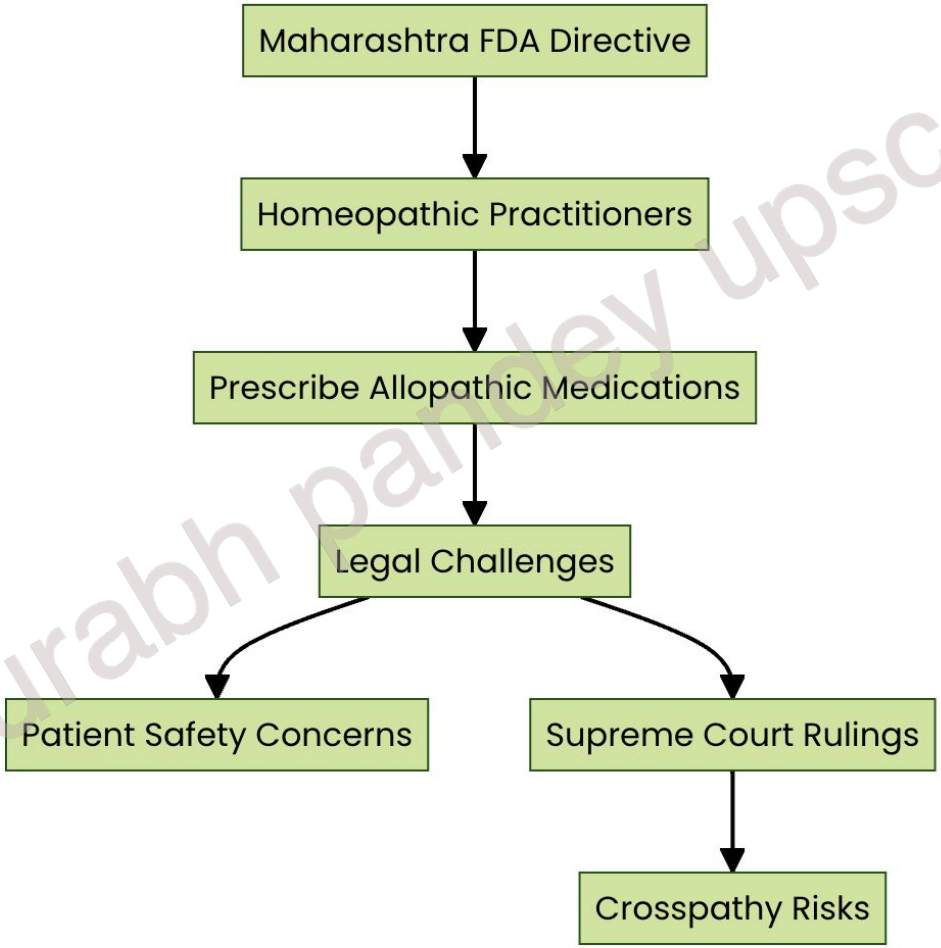
Context and Implications

👩‍⚕️ **Doctor Shortage:** India faces a significant shortage of doctors, especially in rural areas, leading the government to promote AYUSH medicine as a potential solution.
📊 **Statistics:** As of June 2022, India had over 1.3 million allopathic doctors and 565,000 AYUSH doctors, with a critical shortage of specialists in rural health centers.
🔍 **Expert Warnings:** Experts caution that integrating alternative medical practitioners into roles meant for qualified medical doctors could disrupt healthcare delivery.

Summary

The Maharashtra FDA's directive allowing homeopathic practitioners to prescribe allopathic medications is facing legal challenges due to concerns over patient safety and the legality of such practices.

Healthcare System Overview:



Tax avoidance treaties: India sets new norms for claiming benefits

The Central Board of Direct Taxes has issued fresh guidelines for applying the Principal Purpose Test (PPT) provisions under Double Tax Avoidance Agreements or DTAAs; deals with Cyprus, Mauritius and Singapore to remain outside for now

Press Trust of India
NEW DELHI

The Income Tax department has come out with a fresh guidance note on applicability of Principal Purpose Test (PPT) for claiming tax treaty benefits, which will apply prospectively.

The Central Board of Direct Taxes (CBDT) in its guidance note on PPT also clarified the grandfathering provisions under the India-Cyprus Double Tax Avoidance Agreement (DTAA), and the similar pacts with Mauritius and

Singapore would stay outside the purview of the new PPT provisions. India has made certain treaty-specific bilateral commitments in the form of grandfathering provisions in the DTAAs signed with these three nations.

"These commitments, as reflected in the bilaterally agreed object and purpose of such grandfathering provisions, are not intended to interact with the PPT provision as such," the CBDT said.

The grandfathering provision in the treaties would be governed by the specific provisions specified in the respective DTAAs.

Deloitte India partner, Rohinton Sidhwa said the circular clarifies various aspects for interpreting the PPT that now featured in most Indian tax DTAAs.

Crucially, it establishes the primacy of the grandfathering article featuring in some treaties, namely Cyprus, Mauritius and Singapore. The circular protects such treaty-specific bilateral commitments and carves them out of the purview of the PPT provisions.

"This was a grey area when the new protocol was made public for the India Mauritius treaty. With this clarification, there is a likelihood that the protocol would be notified and go into effect in the coming financial year beginning April 1, 2025," he said.

Nangia Andersen LLP partner Vishwas Panjiar said as per the note, PPT provisions shall apply prospectively and would also not be applicable in cases where India has entered into treaty-specific bilateral commitments in the form of grandfathering.

"The guidelines nudge tax authorities to refer to BEPS Action Plan 6 as well as UN Model Tax Convention for supplementary source of guidance while deciding on invocation and application of PPT provisions," Mr. Panjiar added.

Topic → Income Tax Department's New Guidance on Principal Purpose Test

Overview

📜 The Income Tax department has issued a new guidance note on the Principal Purpose Test (PPT) for claiming tax treaty benefits, applicable prospectively.

🌍 The Central Board of Direct Taxes (CBDT) clarified that grandfathering provisions under the India-Cyprus Double Tax Avoidance Agreement (DTAA) and similar agreements with Mauritius and Singapore are exempt from the new PPT provisions.

🔒 India has made treaty-specific bilateral commitments through grandfathering provisions in DTAAs with Cyprus, Mauritius, and Singapore, which are not intended to interact with the PPT.

The principal purpose test (PPT) is a court practice that determines if a transaction's main purpose was to obtain a tax benefit. If so, the tax authorities can deny or challenge the treaty benefits.

How it works

- The PPT is a subjective test that considers whether it's reasonable to conclude that the main purpose of a transaction was to obtain a tax benefit.
-
- The PPT is broader than the GAAR, which requires proof of improper or artificial acts by the taxpayer.
-
- The PPT can be used to deny treaty benefits in cases where the transaction's main purpose was to avoid taxation

Stopping by the woods

Picturesque scene: People walk under trees covered with snow in the Chrea mountains in Blida, Algeria. The Chrea mountains, part of the Tell Atlas range, are known for their winter snowfall, attracting visitors who enjoy the serene landscape and winter sports REUTERS

Topic → Chrea Mountain: A Natural Gem in Algeria

Overview

🏔️ Location: Chrea Mountain is situated in Algeria, forming part of the Tell Atlas mountain range.
🌲 Biodiversity: The region is renowned for its rich biodiversity, hosting a variety of flora and fauna species.

🥾 Recreational Activities: It is a favored destination for hiking and other outdoor pursuits.

🌡️ Climate: The area experiences cool temperatures, particularly during the winter months.

🦅 Conservation: Home to several endemic species, it is a crucial site for conservation efforts.

🏞️ Scenic Views: The mountain provides breathtaking panoramic views of the surrounding landscape.

🏕️ Tourism: Chrea Mountain is a popular spot for camping and nature tourism.

Summary: Chrea Mountain in Algeria is a biodiverse and popular hiking destination known for its cool climate and stunning views

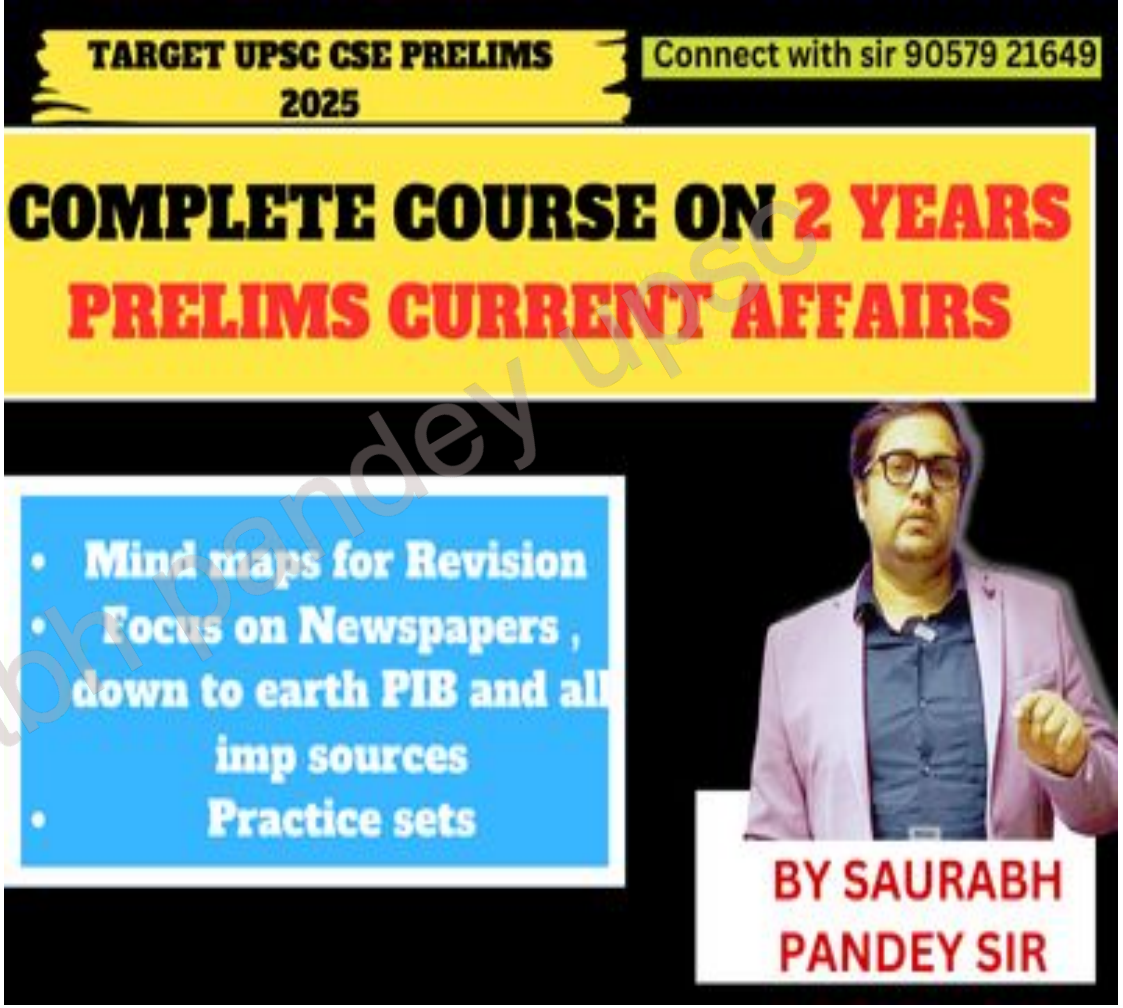
Schedule CRASH COURSE ON UPSC CSE Prelims 2025

Upcoming week, 20th to 25th January (Time: 9 PM)

Monday	20th January 2025	Basics of International Relations Class 2
Wednesday	22nd January 2025	Indian GEOGRAPHY old ncert-Class XI
Friday	24rth January 2025	Basics of International Relations Class 3
Saturday	25th January 2025	Indian GEOGRAPHY old ncert-Class XI

Download the Saurabh Pandey CSE app

For any Query 9057921649—Only Message



Download - saurabh pandey cse app

COMPLETE CRASH COURSE ON UPSC CSE PRELIMS 2025

(SUCCESS Batch)

-->Complete coverage of all static subjects.
NCERTs + Mapping + Advance books + PYQS
--> Developing elimination Tricks.
2 yrs coverage of prelims specific current affairs

By saurabh pandey sir

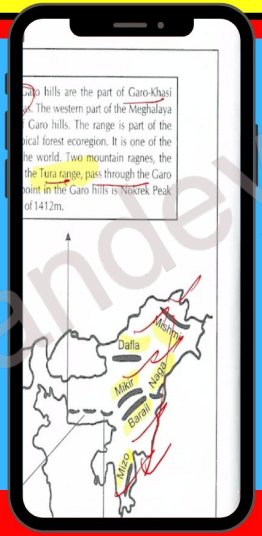
Download saurabh pandey cse app

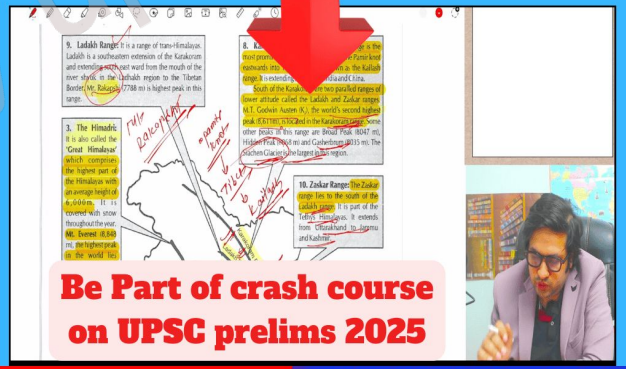
Visit - saurabhpandeyupsc.com

For Any Query Message
9057921649

EVERYTHING IN ONE COURSE !!

Are you missing These Mapping classes ??





Last year 50 + qs from sessions

Download - saurabh pandey cse app

For any query msg
9057921649

AAKLAN PLUS

Plz message - 9057921649

UPSC CSE MAINS 2025/26

Answer writing program

Syllabus (Qs Set 7-11)

Globalisation , society , IR , polity

Timing - QS Set upload - Saturday - 4pm

To join - download saurabh pandey cse app

Download - saurabh pandey cse app

TARGET UPSC CSE PRELIMS 2025

Connect with sir 90579 2164

COMPLETE COURSE ON GENERAL SCIENCE AND SCIENCE & TECHNOLOGY

->Static topics + Advance topics

->All Noble prizes

->NCERT'S

-> MIND MAPS FOR REVISION

BY SAURABH PANDEY SIR

COMPLETE CRASH COURSE ON UPSC CSE PRELIMS 2025

(SUCCESS Batch)

-->Complete coverage of all static subjects.
NCERTs + Mapping + Advance books + PYQS
--> Developing elimination Tricks.
2 yrs coverage of prelims specific current affairs

By saurabh pandey sir

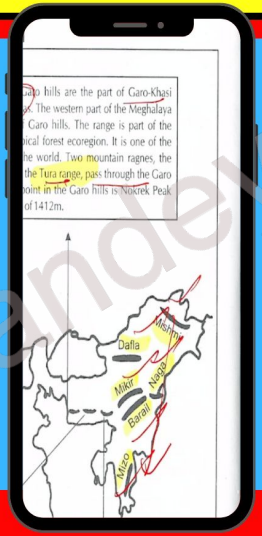
Download saurabh pandey cse app

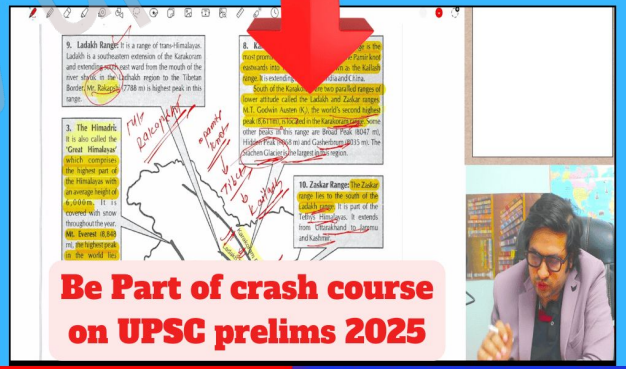
Visit - saurabhpandeyupsc.com

For Any Query Message
9057921649

EVERYTHING IN ONE COURSE !!

Are you missing These Mapping classes ??





Last year 50 + qs from sessions

Download - saurabh pandey cse app

For any query msg
9057921649

saurabhpandeyupsc.com

All Bookm

We're fine-tuning our website in beta mode for the best experience. We're working tirelessly to ensure it's top-notch... Also please join us on Telegram

SAURABH PANDEY CSE (CIVIL SERVICES EXAMINATION) FROM BASICS TO UPSC BRILLIANCE

Categories

Search for anythings...

Login

Visit - saurabhpandeyupsc.com

Home Courses Pages More About UPSC Exam Current-Affairs Pointers

YouTube Channel All Courses

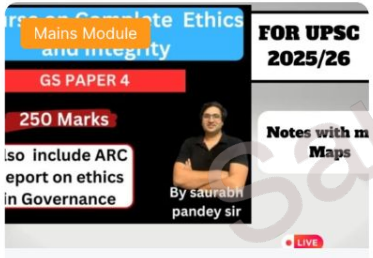
Impo All Courses

...rrent Affairs 22nd & 23rd SEPTEMBER 2024 Current Affairs 21st SEPTEMBER 2024 Curren

Connect with sir
9057921649 (ONLY MSG)

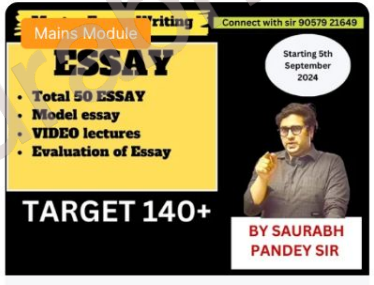
Popular Courses

See More →



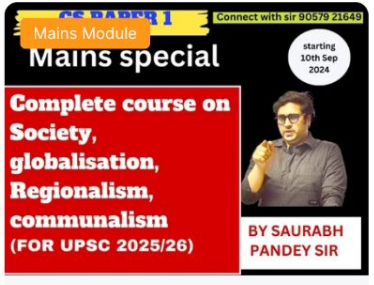
Best Course On Ethics And Integrity For UPSC...

Admin



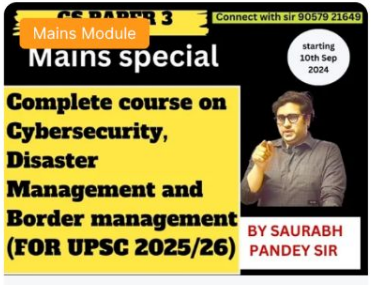
Master The Art Of Essay Writing With This...

Admin



Course On Society , Globalisation...

Admin



Complete Course On Cyber Security ,Disaste...

Admin

Google Play Games Apps Movies Books Kids

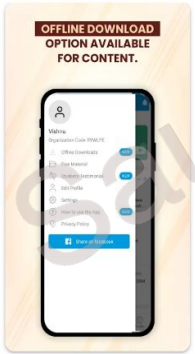
Saurabh Pandey CSE

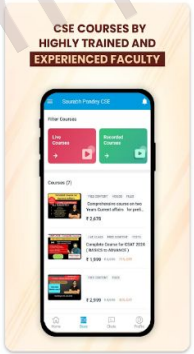
Saurabh Pandey CSE

4.8★ 77 reviews | 1K+ Downloads | 3+ Rated for 3+

Install Share Add to wishlist

This app is available for your device





App support

PDF Download → https://t.me/gesreporter

Q. How many of the given countries border along the Gulf of Aden. (The Hindu)

1) Saudi Arabia

2) Yemen

3) Somalia

4) Eritrea

5) Djibouti

Select the correct code.

A) Only two

B) Only three

C) Only four

D) All five

Target Mains -2025/26 -

Q ‘’.Now more than physical infrastructure , digital infrastructure and AI Infrastructure will decide economic growth of country ‘’ Examine