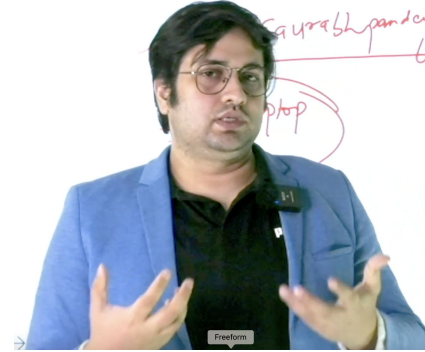


Topics - MINDS MAPS included



- Disaster and local factors
- Ceramics
- Glacier du Tour
- Competition and sustainability.
- Anusandhan National Research Foundation (ANRF)
- Basal melt in Antarctica
- EL NINO and spread of cholera
- Heart failure with a preserved ejection fraction (HFpEF).
- How do high-altitude birds take to the air when thin air offers little lift?
- Vaccine against Malaria
- Mains



By saurabh Pandey



THE HINDU

Target Mains -2024/25 -

Q ‘’ Hyperlocalisation of weather forecasting will prevent many disaster ‘’ Explain in the context of landslide in wayanand

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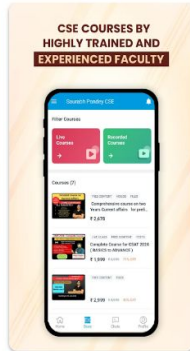
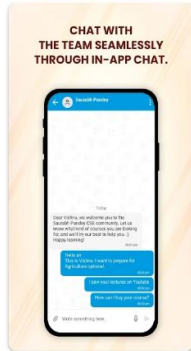
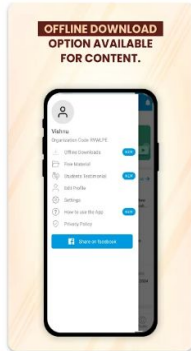
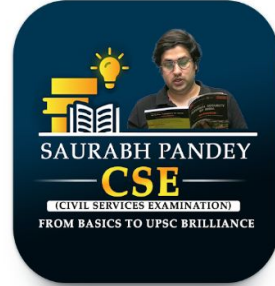
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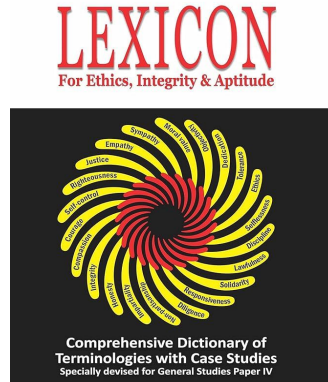
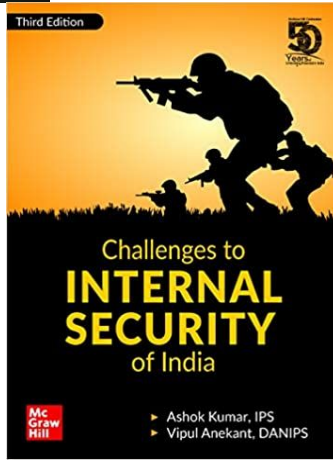
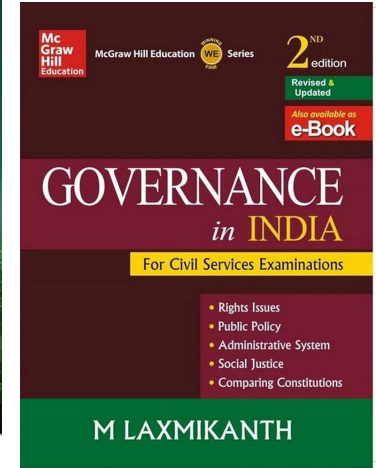
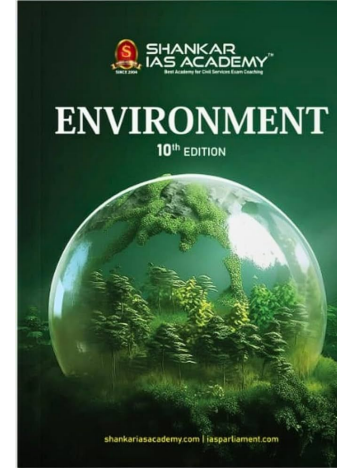
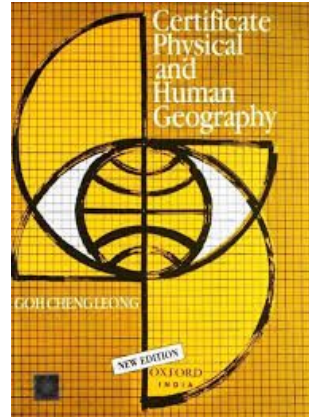
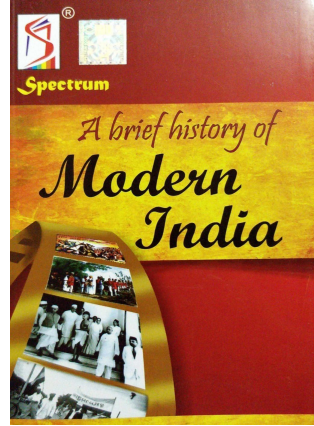
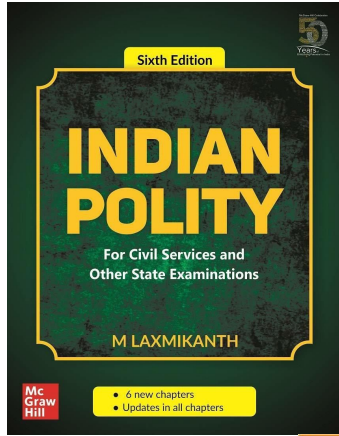
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Topic-Disaster and local factors

- **Tragedies like that in Wayanad on July 30 tend to repeat themselves partly because their lessons are not always brought to bear on our understanding of the local amplifiers of extreme events. Simple changes in land-use patterns could lead to a crushing cloudburst or a punishing hailstorm**
- **Mitigating disasters requires climate outlooks that go out to a decade.**
- **These broad warnings cannot, however, be translated into specific actions and cannot get rid of extreme events. Some events, like landslides, will occur because the risk is never zero**
-

- **Predictions made by models will always be imperfect. An understanding of local drivers is required to improve the ability to predict extreme events.**
- **Climate extremes are driven by events in distant places but are usually exacerbated by factors location-specific**
- **The Western Ghats in Wayanad, Kerala.**

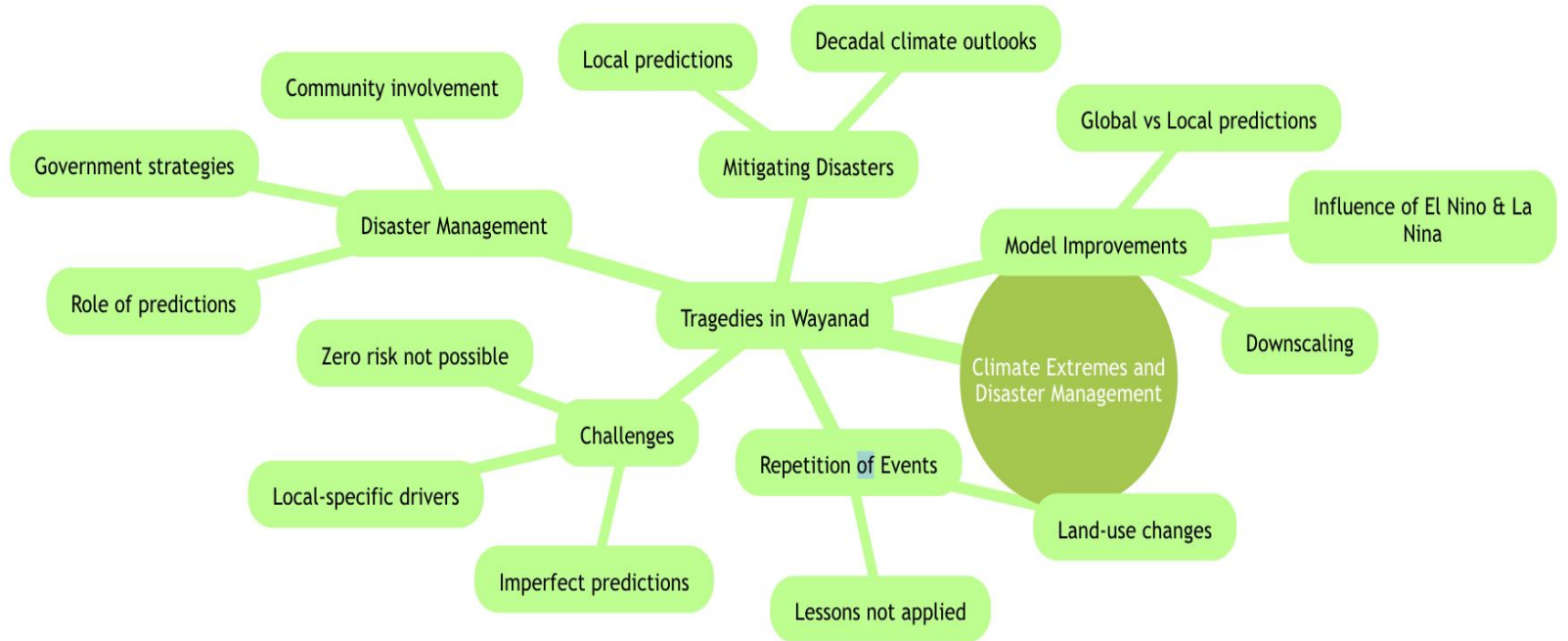
- **Weather predictions with a lead time of a few weeks could help disaster management personnel mobilize towards local threats with high-intensity risk and avoid surprises.**
- **Disaster management and recovery play a crucial role in alleviating the pain of natural disasters. Unfortunately, however, a blame game may follow asking whether earlier warnings could have averted the tragedy**
- **Local top-down efforts by legal authorities and communities can help bolster disaster recovery strategies using mitigation efforts. Governments can also prioritize the funding to the area to deal with such natural and typical risks.**
-

- **adopting location-specific measures like legal protections for biodiversity can help mitigate disasters.**
- **Governments can also bolster their regulatory strategies using predictions of the climate up to a decade in the future and combining each prediction with hyperlocal risks.**

- Global models provide seasonal outlooks and predictions at the short (3 days), medium (3-10 days), and extended (2-4 weeks) range.
- They have been getting better at forecasting thanks to the exhaustive research, the El Nino and La Nina, and other extreme weather events.
- Monsoons are influenced – in significantly different non-linear fashions – by cascading and national importances in these models diagnose live aberrations in the anatomy and report them.
- **One particular approach to improving the models is called downscaling**, especially in dense predictions of extreme events like small-scale heavy rain.
- In downscaling, researchers use a global model to create local predictions in regions where the weather satellites that the global model will miss.

figures:

figure 1.1 mindmap:



Topics- ceramics

- **Ceramics can typically withstand very hot or acidic environments, many forms of chemical erosion, and are hard and difficult to compress. But they are also brittle — i.e. can shatter — and don't handle shear, or sliding, stress well.**
- **The science of preparing and studying ceramics' microscopic properties is called ceramography.**
- **In modernity, scientists have used ceramics on space shuttles (as part of the heat shield during atmospheric reentry) to produce heat in microwave furnaces, as abrasives, in the production of varistors and semiconductors, as nuclear fuel, in fighter aircrafts' windows, and in tomographic scanners, among other settings.**
- **The discovery of high-temperature superconductivity in some ceramic materials won two scientists the 1987 physics Nobel Prize**

Topics-Glacier du Tour

- **A depression filled with meltwater lies on the ice of the Glacier du Tour, its snow tinged pink by dust from the Sahara, near the glacier's terminus near Chamonix, France.**
- **The roughly 5-km-long Glacier du Tour, one of many glaciers in the Mont Blanc massif, is melting fast and glaciologists say climate change is to blame**

- **The Glacier du Tour is a glacier located in the Mont Blanc massif in the French Alps.**
- **It is situated in the Chamonix Valley, near the town of Chamonix-Mont-Blanc, which is a popular destination for mountaineering and winter sports.**

Topic - Competition and sustainability.

- **Competition cannot remain insulated from sustainability.**
- **Combating climate change requires adapting and adopting newer technology that reduces resource consumption and increases innovation through sustainability policies.**
- **For India, to reach its pledged state of net zero emissions, every economic sector must contribute to greener means of production.**
- **The CCI can enforce competition policies that improve innovation while considering environmental concerns.**

- **Competition policy should integrate sustainability economics while considering market failures and collective action problems.**
- **Through actions like issuing guidelines, the benefits of sustainability will outweigh the potential negative effects on competition.**
- **Including sustainability considerations in assessments of cooperation among competitors can be a strong measure of benefitting sustainability in markets.**

- **During the pandemic, the CCI issued an advisory and acknowledged that COVID-19 had caused disruptions in supply chains.**
- **It also noted that information sharing may be required by businesses to ensure fair distribution of products and services.**
- **The Competition Act, 2002 has built-in safeguards to protect businesses from sanctions.**
- **The CCI only considered such businesses that were necessary to address concerns arising from COVID-19.**
- **The CCI can consider releasing advisories where enterprises can be exempted if collaborations are for sustainable goals or greener technological innovations when necessary and proportionate.**

- **Under Section 49(3) of the Competition Act, 2002, the CCI may take measures to promote competition advocacy and awareness.**
- **It may also participate in formulating economic policies that will touch upon competition and sustainability.**
- **The CCI can emphasise on sustainability policies and enterprise collaboration for greener innovations and release guidance notes on sustainability agreements and exemption methods under the Competition Act, 2002.**

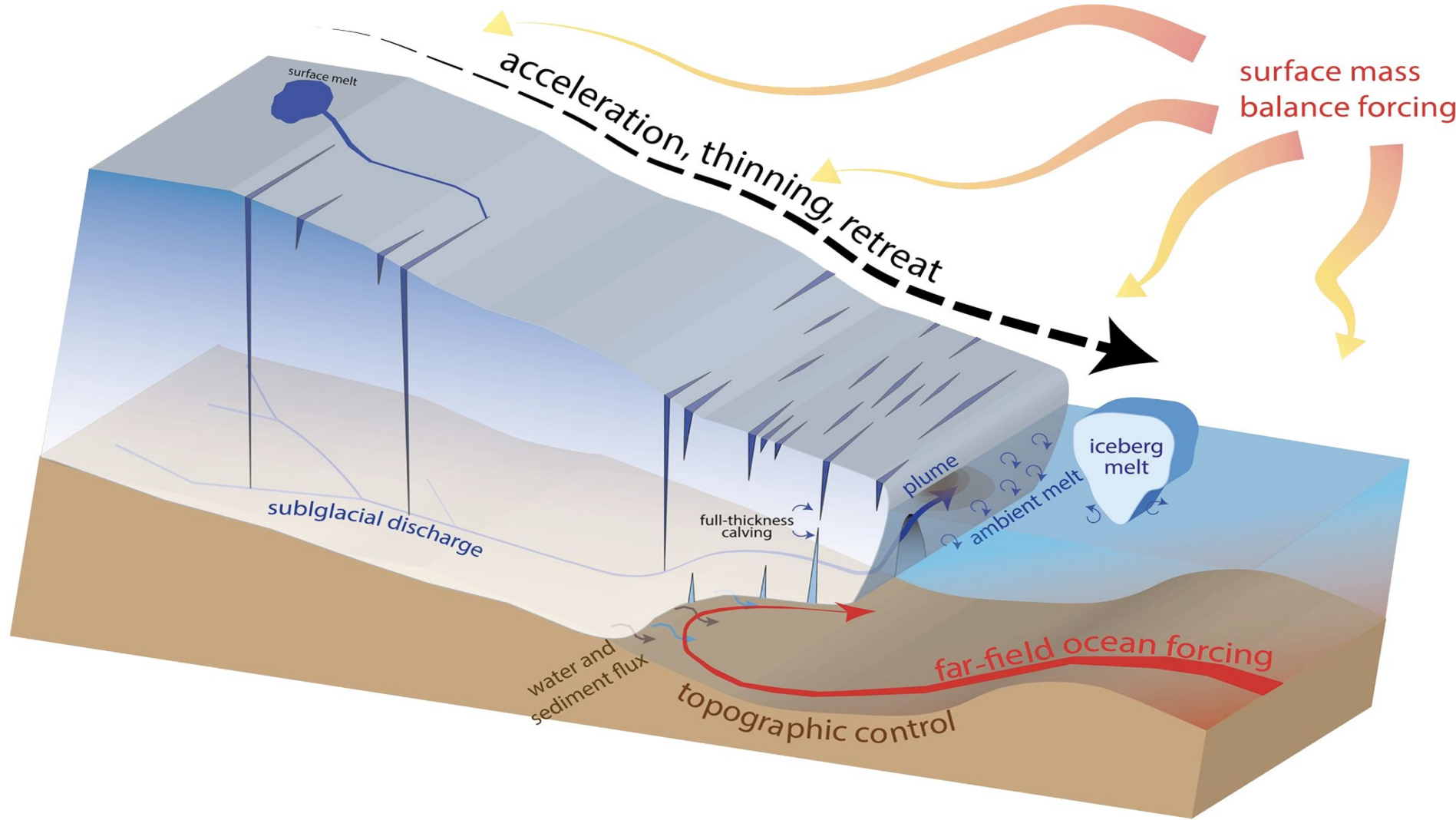
Topic- Anusandhan National Research Foundation (ANRF)

- **The Anusandhan National Research Foundation (ANRF) has been established with Anusandhan National Research Foundation (ANRF) 2023 Act.**
- **The ANRF aims to seed, grow and promote research and development (R&D) and foster a culture of research and innovation throughout India's universities, colleges, research institutions, and R&D laboratories.**
- **ANRF will act as an apex body to provide high-level strategic direction of scientific research in the country as per recommendations of the National Education Policy (NEP).**

- **With the establishment of ANRF, the Science and Engineering Research Board (SERB) established by an act of Parliament in 2008 has been subsumed into ANRF.**
- **ANRF will forge collaborations among the industry, academia, and government departments and research institutions, and create an interface mechanism for participation and contribution of industries and State governments in addition to the scientific and line ministries.**

Topic- Basal melt in Antarctica

- **An ice shelf is a mass of glacial ice, fed from land by tributary glaciers, that floats in the sea above an ice shelf cavity.**
- **Dotson Ice Shelf is part of the West Antarctic ice sheet and next to Thwaites Glacier, which is considered to have a potentially large impact on future sea level rise due to its size and location.**
- **Brought to the Amundsen Sea through ocean circulation, warm salty water is a significant driver of ice melt and, thus, sea level rise.**
- **This bottom-up melting, called basal melt, thins and hollows out cavities at the base of floating ice shelves, reducing or eliminating structural support for grounded ice that flows into them.**
- **Now, researchers have described basal melt patterns at the base of the Dotson Ice Shelf (DIS) located in West Antarctica's Amundsen Sea**



What is Basal melt ??

- Basal melt refers to the melting of ice or snow that occurs at the base of a glacier or ice sheet.
- This process is a critical component of the overall mass balance of glaciers and ice sheets, which in turn affects sea level rise and regional water resources.

Basal melt is influenced by several factors, including:

Geothermal Heat: The Earth's internal heat can warm the base of a glacier or ice sheet, leading to melting.

Pressure: The weight of the overlying ice can increase the pressure at the base, lowering the melting point of ice through a process known as pressure melting.

Frictional Heat: As the glacier moves over its bed, friction can generate heat, contributing to basal melting.

Subglacial Hydrology: The circulation of water at the base of a glacier can transport heat and influence the rate of basal melt.

Climate Change: Increasing global temperatures can lead to warmer air and water temperatures, which can penetrate to the base of glaciers and accelerate basal melt.

- **The meltwater produced at the base of a glacier can play a significant role in the dynamics of the glacier by lubricating the interface between the ice and the underlying bedrock or sediments, potentially leading to faster glacier movement.**
- **This meltwater can also contribute to the formation of subglacial lakes, which can influence the stability of ice sheets and the potential for rapid ice discharge.**
- **Understanding basal melt is essential for predicting the behavior of glaciers and ice sheets in a changing climate.**
- **Scientists use a variety of methods to study basal melt, including borehole measurements, radar imaging, and numerical modeling. These studies help to inform projections of sea level rise and water resource management strategies in glacier-fed river systems.**



Topic- EL NINO and spread of cholera

- **A study suggests that an El Niño event may have aided the establishment and spread of a novel cholera strain during a 20th-century pandemic; climate anomalies could create opportunities for the emergence of new strains.**
- **The study revealed that anomalous patterns of cholera deaths from 1904 to 1907 occurred alongside out-of-the-ordinary seasonal temperatures and rainfall levels associated with an El Niño event.**
- **The timing correlates with the establishment of a new strain during the sixth pandemic.**

Topic- Heart failure with a preserved ejection fraction (HFpEF).

- **A small study has revealed the impact of obesity on muscle structure in patients having a form of heart failure called heart failure with a preserved ejection fraction (HFpEF).**
- **Originally, this form of heart disease was associated with having a high blood pressure and excess muscle growth to help counter the pressures.**

Topic-How do high-altitude birds take to the air when thin air offers little lift?

- **In high altitudes, despite the air being of low density, which makes the bird wings produce less lift and more difficult to remain aloft, high-altitude birds have been seen at high altitudes of over 6,000metres.**
- **One possibility of how birds at high altitudes take to the air may be simply flying faster to compensate for the lower air density**

Topic- Vaccine against Malaria

Bharat Biotech, which has already been working on some malaria-related vaccines, has tied up with GSK-PATH for technology transfer for long-term supply of 'Mosquirix', and hopes to manufacture and supply it to people in India by 2026.

In 2021, the WHO also recommended the R21/Matrix vaccine.

DEET

- **N,N-Diethyl-meta-toluamide, commonly known as DEET, is a chemical compound used as the active ingredient in many insect repellents.**
- **It was developed by the U.S. Army in 1946 and has been widely used since then to protect against mosquitoes, ticks, fleas, and other insects.**
- **DEET is effective against a broad range of insects and has been shown to provide long-lasting protection against bites**

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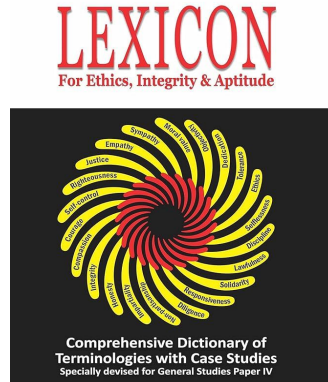
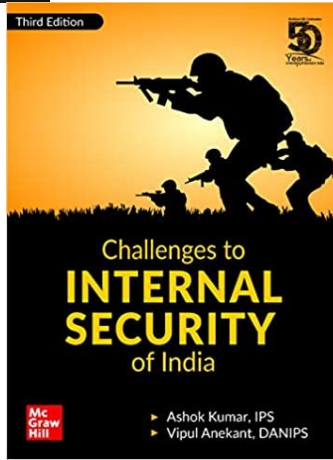
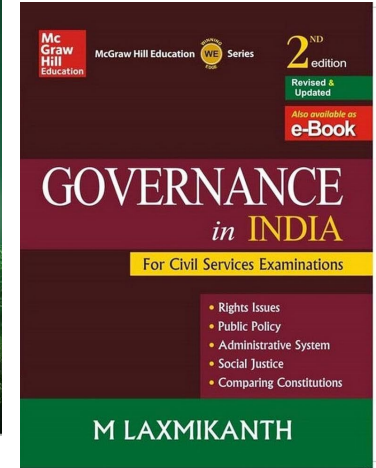
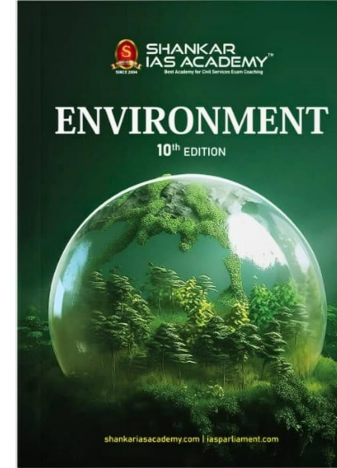
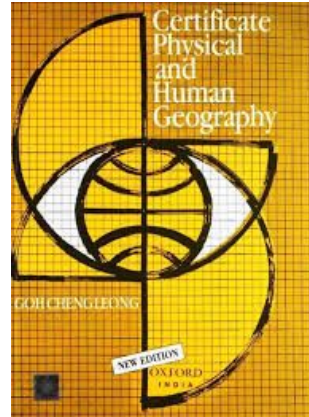
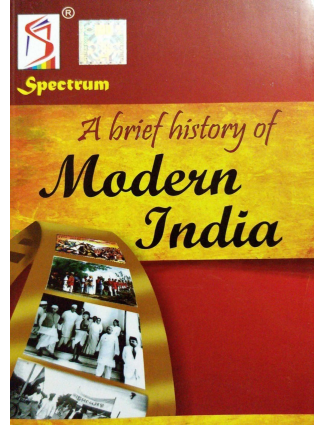
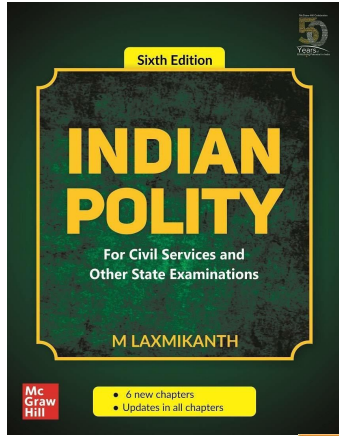
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