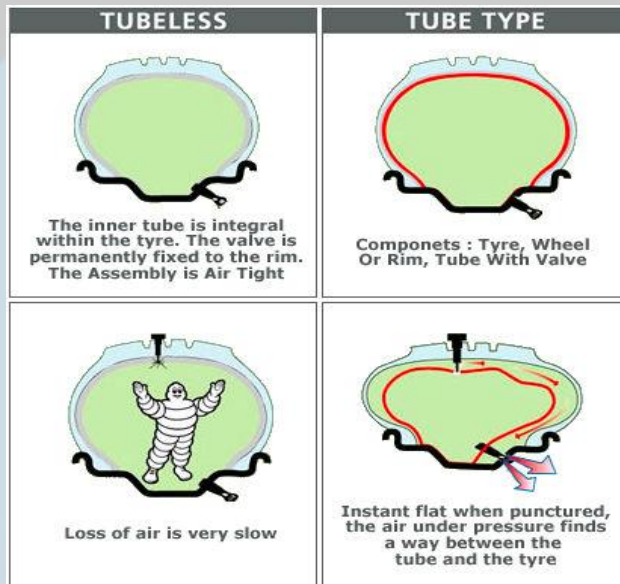


## Tubeless tyre



- In conventional tubed tyres, the load is carried by a volume of air held inside a tube, which is closed to the inside of the rim at the bottom and to a tyre over the remaining area. In tubeless tyres, the tyre itself holds the air.
- Outwardly, a tubeless tyre resembles a tubed tyre.
- The inside of a tubeless tyre has an airtight lining extending beneath the bead the part of the tyre that anchors it to the rim when inflated.
- In order to provide perfect sealing, a special coat of rubber is provided to the inside wall of the tyre which is fitted to the rim using rubber seals. The special bead seating (on the rim) also prevents air leaks.
- There is no need for a flap and so a valve is fitted to the rim itself for inflating or deflating the tyre.

The Hindu

- Tubeless tyres are not popular in India for two reasons.
- First, rusting of rims, which leads to air leaks, is a perennial problem in a tropical climate.
- Second, fitment of such tyres needs special tools and presses and so they cannot be repaired in roadside shops.

Mount Marapi

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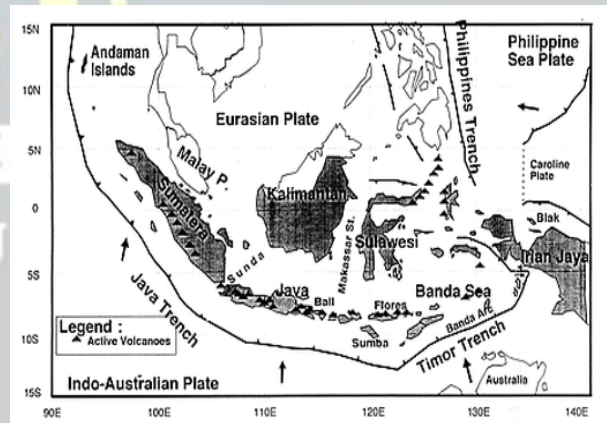
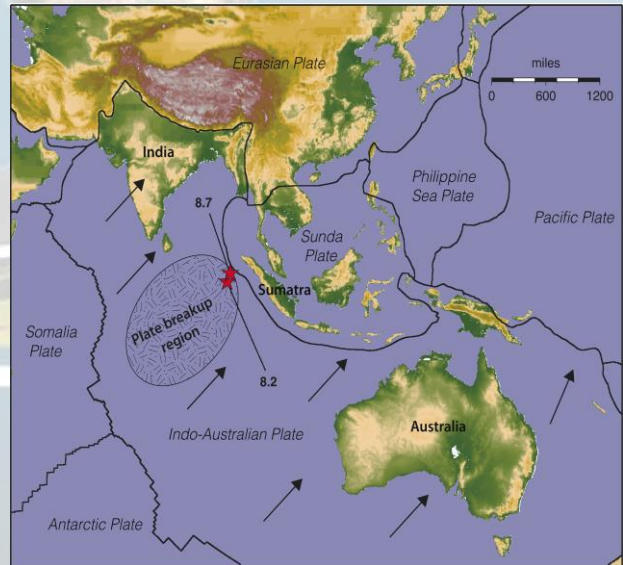
**BIG SHOT**



Mount Merapi spews volcanic material during an eruption in Agam, West Sumatra, Indonesia, on Sunday. Dozens of people living on the slopes of Mount Merapi have been evacuated after Indonesian authorities raised the alert level of the nearly 2,900-metre volcano to the second highest as it continues to erupt. AP



- The Marapi, or Mount Marapi, is a complex volcano in West Sumatra, Indonesia, and is the most active volcano in Sumatra.



- India's relationship with the Maldives, built over time, is a comprehensive one.

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- While the Maldives needs India, it is true that India needs the Maldives equally.
- The Maldives is India's key maritime neighbour in the Indian Ocean Region.
- It has also consistently taken pro-India positions in the Organisation of Islamic Cooperation.
- China and the Maldives also elevated their bilateral ties to a 'comprehensive strategic cooperative partnership'.
- In addition, Chinese President Xi Jinping said that China "respects and supports the Maldives in exploring a development path suited to its national conditions".
- According to the vocabulary of Chinese diplomacy, this means that China wants the Maldives to emerge out of India's shadows.
- Wolf warrior diplomacy, China informed the world how its political system was better at handling the pandemic than the West.
- Wolf warrior diplomats in China often defend China's interests against what they perceive as hostility from abroad.
- Thereby, they resort to the rhetoric of authoritarianism as being more efficient than other systems and better at delivering the public good.

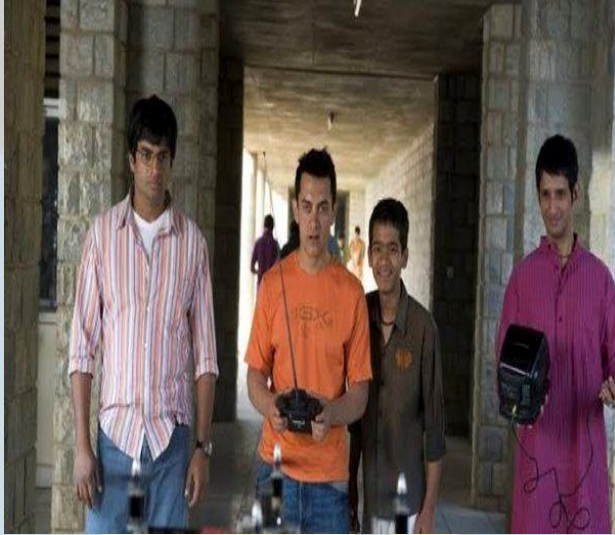


The Hindu

### Wolf warrior diplomacy??

- Wolf warrior diplomacy is a style of coercive diplomacy adopted by Chinese diplomats during the Xi Jinping administration.
- The term was coined from the title of the Chinese action film Wolf Warrior 2.

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many States, bringing down elected governments.

- Therefore, to ensure the stability of elected governments, the 52nd constitutional amendment introduced the 'antidefection' law through the Tenth Schedule in 1985.
- This Schedule provides that a member of a House of Parliament or State legislature who voluntarily gives up the membership of their political party or votes against the instructions of their party in a House are liable for disqualification from said House.
- This instruction with respect to voting is issued by the 'whip' of a party. A 'whip' is a member of the 'legislature party' in a House who is appointed as such by the respective 'political party'.
- The 'political party' is the entire organization of a party including the legislators, while the 'legislature party' is only the members of a political party in a House of Parliament or State legislature.

### Why was the Tenth Schedule made?

- The defections of legislators during the 1960s and 70s from their parent parties created political instability in

- The Tenth Schedule originally provided for two exceptions that would not render the members liable for disqualification.

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- First, one-third of the members of the 'legislature party' split to form a separate group (para 3).
- Second, a merger of their 'political party' with another party that is approved by two-thirds of members of its 'legislature party' (para 4).
- However, considering the need to strengthen the 'anti defection' law, para 3 was omitted in 2003.

### What are the issues involved?

- With the deletion of para 3, there have been instances of two third members of a legislature party 'practically' defecting but claiming to be the original political party to escape disqualification.
- There have also been instances where more than two-thirds of members of a State 'legislature party' of a national political party merged themselves with another political party to escape disqualification.

### What are the reforms needed?

- The Supreme Court in Sadiq Ali versus Election Commission of India (1971), laid down the three test formula for determining which faction is to be recognized as the original political party by the Election Commission.
- These are aims and objects of the party; its affairs as per the party's

constitution that reflect inner party democracy; and majority in the legislative and organisation wings.

- The first test is subject to competing claims by rival groups. But it is lack of inner party democracy that results in most of these defections.
- The Hindu

### PVR and Competition commission



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### The story so far:

- Having found “no discernible competition concern,” the Competition Commission of India (CCI) rejected a complaint alleging that multiplex chain PVR had abused its dominant market position.
- Yogesh Partap Singh, a film director, had accused the multiplex chain of according preferential treatment to films from large production houses over those by independent filmmakers.

### What was PVR's response?

- PVR denied the allegations.
- It said that the allegations were not backed by evidence.
- Further, the chain argued that the purpose of the complaint was to “pressurize” it to exhibit his film, in the absence of any legal obligation to do so.

- PVR clarified that it has no special tie ups or recurring/long-term arrangements.

### What does the CCI's order say?

- After examining the submissions of the multiplex chain, CCI concluded that there existed no perceptible concern about competition.
- Its order held that the commercial wisdom of the exhibitors is largely driven by consumer demand.
- Unless harm to competition was apparent, any intervention on its part would only lead to “undesirable consequences,” it noted. T.

### About Competition commission

- The Competition Act, 2002 was passed by the Parliament in the year 2002, to which the President accorded assent in January 2003.
- It was subsequently amended by the Competition (Amendment) Act, 2007.
- In accordance with the provisions of the Amendment Act, the Competition Commission of India and the Competition Appellate Tribunal have been established.
- The Competition Commission of India is now fully functional with a Chairperson and six members.

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- The provisions of the Competition Act relating to anti-competitive agreements and abuse of dominant position were notified on May 20, 2009.
- The Competition Commission of India ('Commission') has been established to enforce the competition law under the Act.
- The Commission consists of a Chairperson and not more than 6 Members appointed by the Central Government.
- It is the statutory duty of the Commission to eliminate practices having adverse effect on competition, promote and sustain competition, protect the interests of consumers and ensure freedom of trade carried on by other participants, in markets in India as provided in the Preamble as well as Section 18 of the Act.
- The Hindu

### Ice berg

Tip of the iceberg



A cruise ship sails at the Gerlache Strait -which separates the Palmer Archipelago from the Antarctic Peninsula. AP



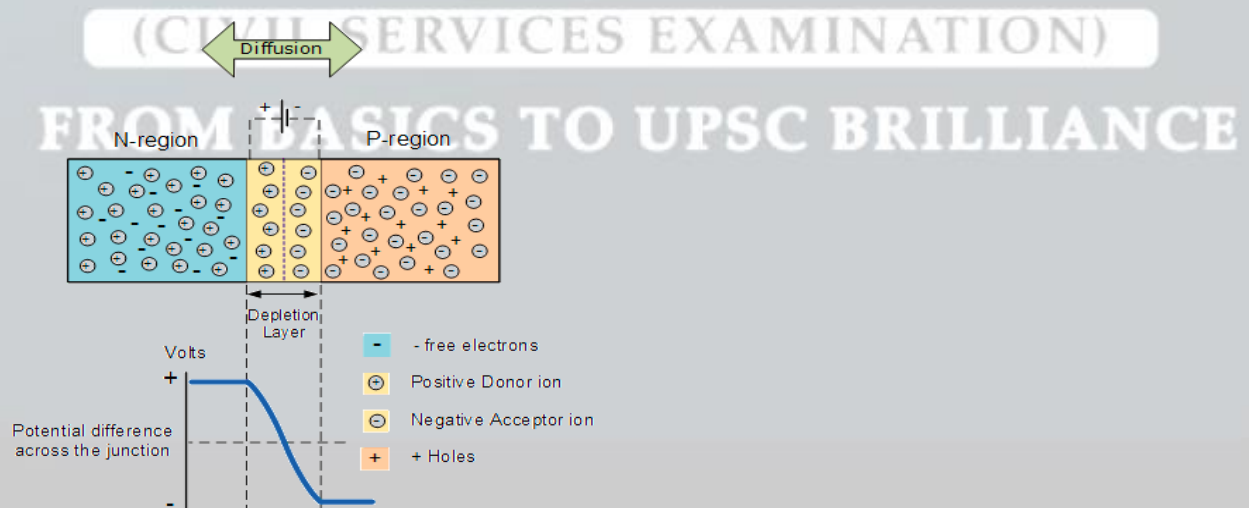
- Gerlache Strait or de Gerlache Strait or Détroit de la Belgica is a channel/strait separating the Palmer Archipelago from the Antarctic Peninsula.
- Four tectonic blocks are identifiable in the Gerlache Strait area, bounded by two systems of Tertiary strike-slip faults.
- The longitudinal faults include the SW-NE trending Neumayer Fault that extends from Peltier Channel across Wiencke Island, and then onwards most likely as the Gerlache Fault.
- The SW-NE trending Fournier Fault parallels the Gerlache Fault and divides Anvers Island.
- The transverse faults trend E-W and SE-NW across Wiencke Island and Brabant Island, and include the Schollaert Channel faults.

- The Danco Coast Block extends from Cape Willems to Wilhelmina Bay.
- The Brabant Island Block encompasses the southern portion of that island. The Neumayer Channel Block is bound by the Neumayer Fault and the Fournier Fault.
- The Anvers-Melchior Islands Block includes northwest Anvers Island and its offshore islands Melchior Islands.

The Hindu

### PN Junction and working of LED

- “The 21st century will be lit by LED lamps.”
- The occasion was the awarding of the Nobel Prize for physics for that year, for an achievement that paved the way for light emitting diodes (LEDs), to succeed incandescent bulbs and fluorescent lamps, as the world’s light source of choice.





### What are diodes?

- A diode is an electronic component about 5 mm wide. It has two points of contact, or terminals, called its anode and cathode.
- A diode's primary purpose is to allow current to flow in only one direction. It achieves this using a pn junction.
- A pn junction is made of two materials laid next to each other.
- One material is a ptype material: its primary charge carriers are holes.
- The other is an n type material: its primary charge carriers are electrons. Electrons: they are 'places' inside atoms that carry negative charge.
- A hole denotes a 'place' in an atom or a group of atoms where there could be an electron but isn't.
- Thus, a hole is an electron placeholder but without the electron, so it has a positive charge.
- A p-n junction is an interface where the surface of a ptype material and the surface of an n type material meet.
- At this interface, electrons can pass easily from the n type material to the p type material but can't go the other way.

### What is an LED?

- An LED is a diode that emits light.
- Inside the diode's pn junction, the electrons have more energy than the holes.
- When an electron meets and occupies a hole, it releases energy into its surroundings.
- If the frequency of this energy is in the visible part of the electromagnetic spectrum, the diode will be seen to emit light.
- The overall phenomenon is called electroluminescence.
- The energy of a wave is proportional to its frequency.
- So making sure the light emitted by an LED is visible light is a matter of making sure the electron hole recombination releases a certain amount of energy, not more and not less.

### What is the band gap?

- Particles like electrons can only have specific energy values.
- They can occupy only particular energy levels.
- When a group of electrons comes together in a system they're required to follow some rules.

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- One of them is that no two electrons can occupy the same energy level at the same time.
  - These electrons generally prefer to have lower energy, and thus prefer to occupy the lowest available energy level.
  - If that level is taken, they occupy the next available level. Sometimes they can acquire more energy, tear free from their atoms, and flow around the material.
  - In these circumstances, we say the material is an electrical conductor.
  - When the electrons don't have enough energy to flow around, the material is an insulator.
  - Electrons can acquire such extra energy when an electric field is applied to the material.
  - The field will accelerate the electrons and energise them, and the electrons will be 'kicked' from lower to higher energy levels.
  - It's the reason why electrons in these materials can't conduct an electric current unless they receive a minimum amount of energy the energy required to jump across this gap.
  - This gap is called the band gap.
  - In LEDs, the energy emitted when an electron and a hole recombine is the energy of the band gap.
  - By carefully choosing the materials that make up the p-layer and the n-layer, researchers can engineer the composite pn junction to have a band gap that corresponds to visible light.
- ### What colours can an LED produce?
- Since LEDs can produce all three primary colours red, green, and blue different LEDs can be combined on a display board to produce a large variety of colours.
  - The reason: scientists had identified a compound, gallium nitride, that was electroluminescent and whose band gap could yield blue light.
- ### What are the advantages of LEDs?
- According to Moore's law, specified by American engineer Gordon Moore in the 1970s, the number of transistors on a chip would double every two years.
  - Similarly, improvements to LEDs since 1970 have followed Haitz's law.
  - Named for scientist Roland Haitz, it states that for a given frequency of light, the cost per unit of light of an LED will drop 10x and the amount of light it produces will increase 20x every decade.

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- But even before Hertz's law, researchers prized LEDs because they were more efficient than incandescent bulbs and fluorescent lamps.
- Per watt of power consumed, LEDs can produce up to 300 lumen (amount of visible light emitted per second) versus incandescent bulbs' 16 lumen and fluorescent lamps' 70 lumen.
- Together with their greater durability and light contrast, LEDs' advantages translated to higher cost savings and less material waste.
- LEDs have several applications in industry, consumer electronics, and household appliances: from smartphones to TV screens, signboards to 'feeding' plants light in greenhouses, barcode scanners to monitoring air quality.

(CIVIL SERVICES EXAMINATION)

FROM BASICS TO UPSC BRILLIANCE