UPSC Daily Current Affairs| Prelim Bits 09-04-2025

CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart)

Prelims – *Current events of national and international importance | General Science.*

Mains – *GS-III (Science and Technology- developments and their applications and effects in everyday life)*

Why in news?

In recent times, threat actors have been leveraging fake CAPTCHAs to distribute the Legion-Loader malware, ultimately leading to the installation of a malicious browser extension designed to steal sensitive user data.

- CAPTCHA is a *security mechanism* that presents challenges easy for humans to solve but difficult for machines.
- It was introduced in the early 2000s, with *Luis von Ahn and his team filing the first patent in 2003*.
- CAPTCHA protects websites from automated attacks and *prevents bots from accessing sensitive user data*.

Evolution

- **Initial Phase** – Early CAPTCHAs *primarily used distorted text* for human verification.
- **reCAPTCHA (2009)** – Utilized words from scanned books for verification, simultaneously helping digitize printed texts.
- **Invisible reCAPTCHA (2014)** – *Google introduced* this version which analyzed user behavior patterns such as mouse movements to determine human identity, reducing user friction.
- **Modern CAPTCHAs** – Now include *image recognition tasks, puzzles* and behavioral analysis techniques.

Working Mechanism

- CAPTCHA is fundamentally based on the Turing test concept.
- **Turing Test** – A method *proposed by Alan Turing in 1950* for determining if a machine can exhibit intelligent behavior indistinguishable from a human's.
- Modern CAPTCHAs leverage the cognitive gap between human perception and machine learning capabilities.

Limitations

- **AI Advancement** – Sophisticated bots can increasingly bypass CAPTCHA systems using machine learning algorithms.
- **Accessibility Issues** – Presents significant challenges for *people with visual, auditory, or cognitive disabilities*.
- **User Experience** – Poorly designed CAPTCHAs cause frustration and may reduce website engagement.

Way Forward

- **Adaptive Security** – Development of context-aware verification that adjusts difficulty based on risk assessment.
- **Inclusive Design** – Creation of *multimodal CAPTCHAs* that accommodate various disabilities while maintaining security.
- **Behavioral Analysis** – Increasing reliance on passive verification through *user behavior patterns rather than explicit challenges*.
- **Integration with Other Security Measures** – Combining CAPTCHAs with multi-factor authentication and risk-based authentication systems.

Reference

1. The Hindu | CAPTCHA
2. Gbhackers | CAPTCHA

Past Risk and Return Verification Agency (PaRRVA)

Prelims - *Regulatory Bodies (SEBI), Recent initiatives in financial market regulation.*

Mains (GS III) - *Indian Economy – Mobilization of resources, Government Budgeting, SEBI reforms and investor protection mechanisms.*

Why in news?

Securities and Exchange Board of India (SEBI) issued the operational framework for Past Risk and Return Verification Agency (PaRRVA).

- **Purpose** - It is the main verification agency that will *validate past performance claims made by investment advisors, research analysts, and algo providers.*
- **Investment advisors** – They are SEBI-registered professionals offering ***personalized financial advice*** to clients.
- **Research analysts** – They are also SEBI-registered research and provoide recommendations on financial instruments such as stocks and mutual funds.
- **Algo providers** – They provide trading services through *computerized trading using proprietary algorithm*.
- **Need for verification** – It prevents misleading performance claims and ensures transparency for investors.
- It also standardizes risk-return calculations and protects against cherry-picking or exaggeration.

- **Eligibility:**
  - Must be a Credit Rating Agency (CRA).
  - Minimum ***15 years*** of existence.
  - Minimum Rs.100 crore net worth.
  - Must have rated *at least 250 issuers of debt securities*.
  - Must have an investor grievance redressal system, including online dispute resolution.
  - Must enter an agreement with the PaRRVA Data Centre (PDC).
  - Following approval from SEBI, the CRA would have to develop the infrastructure within 3 months.
- The number of PaRRVA isn't fixed any eligible Credit Rating Agency can become a PaRRVA on approval of SEBI.
- **Responsibilities - Creates Rules for Fair Comparison -** PaRRVA will *set the standard method for how risk and return are calculated.*
- **No Cherry-Picking Allowed -** Investment advisors and algo providers can't pick the best time periods to show their results.
- They must present a full, fair picture not just the "good parts".
- **No Highlighting Only One Product -** They also can't only show the best-performing product or service and hide the rest. All data must be transparent.
- **All Claims Must Link to Verified Data -** Every claim whether in a PDF, email, brochure, or website must include a link or QR code.
- That code will take investors to PaRRVA's website, where they can see the full summary of how the performance numbers were verified.
- **PaRRVA Data Centre (PDC) -** This will be the *data repository and infrastructure provider* that supplies all required data for verification.
- **Eligibility -** A stock exchange will be designated by SEBI as the PDC.
- Responsible for providing secure and verified market data to PaRRVA.
- Must maintain infrastructure for data sharing, grievance handling, and QR code generation for performance summaries.

Reference

Business Standard | PaRRVA

Agasthyamalai Landscape

Prelims – *General issues on Environmental ecology, Bio-diversity and Climate Change*

Mains – *GS IV* – *Biodiversity, Environment, Conservation, environmental pollution and degradation, environmental impact assessment.*

Why in News?

The Supreme Court of India has directed the Central Empowered Committee (CEC) to conduct a detailed survey of the tropical forest ecosystems in the Agasthyamalai landscape.

Agasthyamalai Biosphere Reserve

- **Location** – In the Southern Western Ghats including ***Tamil Nadu and Kerala.***
- It is part of the *Western Ghats biodiversity hotspot.*
- **Status** – It is recognised by the UNESCO as a Biosphere Reserve.
- **Named After** – The Sage Agastya, with cultural and spiritual significance in Tamil tradition.
- **Fauna -** Lion-Tailed Macaques, Bengal Tiger, Nilgiri Marten, Nilgiri Tahr, Malabar Spiny Dormouse, Great Pied Hornbills, Gaur, and Sloth Bear.
- **Flora -** Abundant in *rare herbs and medicinal plants*, with around 2,000 medicinal plants used in Ayurvedic treatments found here.
- **Protected Areas**
    - Neyyar, Peppara, and Shendurney Wildlife Sanctuaries,
    - Kalakad Mundanthurai Tiger Reserve,
    - Periyar Tiger Reserve and
    - Srivilliputhur Grizzled Squirrel Wildlife Sanctuary (TN).
- **Tribes –** Kani Tribes inhabited in this area.

Supreme court judgment on Agasthyamalai Landscape

- The judgement came on 2 separate petitions,
- **Public Interest Litigation** – It was initiated by environmental activists who sought judicial intervention to protect this biodiversity hotspot.
- **Private litigation** – It was filed by tea estate worker, seeking rehabilitation and compensation following their displacement from the Singampatti tea estate (Tamil Nadu) as it was reclassified as a reserved forest and tiger habitat between 2007 and 2018.
- **Judgement** – The Supreme Court directed the Central Empowered Committee (CEC) *to conduct a detailed survey of the Agasthyamalai landscape* to assess encroachments and non-forestry activities.

Role of Central Empowered Committee (CEC)

- It is a ***Supreme Court*** appointed body to ensure compliance with environmental norms and court orders.
- It is tasked with preparing a comprehensive report on the extent of encroachments and suggesting restorative measures.
- Will provide guidelines for the rehabilitation of affected communities, such as those evicted from forest lands.
- **Areas included in the CEC survey**
    - The Periyar Tiger Reserve
    - Kalakad and Mundanthurai Tiger Reserve (KMTR)
    - Meghamalai and Tirunelveli Wildlife Sanctuaries
    - Sivilliputhur Grizzled Squirrel Sanctuary

Reference

The Hindu | Forest Survey for Agasthyamalai

PM Modi awarded Sri Lanka's Mitra Vibhushana

Prelims – *Current events of International Importance*

Mains (GS II) – *Bilateral relations*

Why in News?

Shri Narendra Modi (1st Indian) was honored with the Sri Lanka Mitra Vibhushana Award.

- Sri Lanka Mitra Vibhushana is the highest honour bestowed on foreign leaders.
- It honours ***Heads of State and government heads*** with whom Sri Lanka has cordial relations.
- It appreciates their friendship towards and solidarity with the people of Sri Lanka.
- **Instituted in –** 2008.
- **Instituted by -** Mahinda Rajapaksa (former President of Srilanka).
- This award ranks *higher than the national honours granted by Sri Lanka*, including the Sri Lanka Rathna (equivalent to the Bharat Ratna).



- The award consists of a *citation and a silver medal* studded with Navarathna, or 9 Sri Lankan gems.
- The Navarathna surrounds a globe encircled by lotus petals.
- At its centre is a Pun Kalasa, a ceremonial pot with rice sheaves, akin to the kalasa used during Sankranti. It signifies prosperity and renewal.

- The top of the medal bears symbols of the Sun and the Moon. It also features a Dharma Chakra, representing the shared *Buddhist heritage of both countries.*
- The medal is worn around the neck with a 6.5 cm wide ribbon.
- The award is granted at the *President's discretion*.

Other foreign country awards received by PM Modi

Saudi Arabia's Order of King Abdul Aziz	**Mauritius**' Grand Commander of the Order of the Star and Key of the Indian Ocean	**United States'** Legion of Merit
Order of the State of **Palestine**	**Russia**'s Order of St Andrew	**Papua New Guinea**'s Order of Logohu
United Arab Emirates' Order of Zayed	State Order of Ghazi Amir Amanullah Khan of **Afghanistan**	**Egypt**'s Order of the Nile
Order of **Fiji**	Order of the Distinguished Rule of Nishan Izzuddin of **Maldives**	Legion of Honour of **France**
Egypt's Order of the Nile	King Hamad Order of the Renaissance of **Bahrain**	Order of Honour of **Greece**
Bhutan's Order of the Dragon King		

References

1. PIB | Sri Lanka Mitra Vibhushana award
2. The Indian Express | Sri Lanka Mitra Vibhushana

Jaya Sri Maha Bodhi Tree

Prelims – *Current events of International Importance*

Mains (GS II) – *Bilateral relations*

Why in News?

Prime Minister Narendra Modi recently visited the Jaya Sri Maha Bodhi temple at the historic city of Anuradhapura during his trip to Srilanka.

- Jaya Sri Maha Bodhi tree is considered the ***oldest living cultivated plant in the world.***
- It is believed to have grown from a branch that an Indian princess carried to ***Sri Lanka.***
- This Bo (Ficus religiosa, Pipal in Hindi) tree is believed to have grown from a branch of the tree in Bodhgaya (Bihar) under which Gautam Buddha attained enlightenment.
- The branch was carried to Sri Lanka by ***Sanghamitta*** (or Sanghamitra), the Mauryan king Ashoka's daughter and Buddhist nun.

- **Spread of Buddhism in Sri Lanka -** During the reign of Ashoka, the 3rd Buddhist Council was convened, where it was decided to send missionaries to various regions to propagate the teachings of Buddhism.
- As part of this mission, Mahinda, Ashoka's son, travelled to Sri Lanka.
- There, he met ***King Devanampiya Tissa***, who was the ruler of Anuradhapura, and successfully converted him to Buddhism.
- Sanghamitta had travelled to Sri Lanka in response to an invitation from King Devanampiya Tissa, as well as the request of her brother, Mahendra (or Mahinda).
- Her arrival in Sri Lanka with the tree is still celebrated as *Uduvapa Poya,* an annual festival observed on a full moon night in December.
- The tree, along with the other Buddhist shrines in the ancient city of Anuradhapura, is a major pilgrimage centre for Buddhists.
- **Anuradhapura** - It is a ***UNESCO World Heritage Site.***
- Anuradhapura was established around the 4th century BCE by King Pandukabhaya, the first King of Sri Lanka.
- Anuradhapura remained the capital of Lankan rulers from 377 BC to 1017 CE.
- It is known for its ancient monuments, monasteries, and palaces, which have drawn pilgrims and historians alike for centuries.
- **Other Buddhist sites in Anuradhapura -** Jetavanaramaya Stupa, Ruwanwelisaya Dagoba, Isurumuniya Temple, Ranmasu Uyana.

References

1. The Indian Express | Jaya Sri Maha Bodhi Tree
2. Times Now | Jaya Sri Maha Bodhi in Sri Lanka

Long-snouted vine snake

Prelims – *Bio-diversity.*

Mains (GS III) – *Conservation.*

Why in News?

A rare long-snouted vine snake has been rediscovered in the Dudhwa Tiger Reserve in Lakhimpur Kheri, Uttar Pradesh.

- It is a species of long-snouted ***arboreal and diurnal*** snake.
- **Scientific Name -** Ahaetulla longirostris.
    - It is a member of the *A. fusca* clade and as a sister the species to *A. laudankia*.
- Previously, Ahaetulla longirostris had only been recorded once in Bihar and Odisha in 2024.
- **Appearance –** It can be bright green or orange brown. They typically have orange bellies.
- **Habitat** - These snakes live in forests as well as human-dominated areas like cities.
- **Distribution** - Commonly found in Southeast Asia.
- **Size** - Can reach a length of 4-feet.

- **Characteristics -** It has horizontal, keyhole-shaped pupils, which enhances their binocular vision, aiding them in hunting and navigating their arboreal environment.
- It is mildly poisonous, not very dangerous for humans.
- It is ovoviviparous, meaning it gives birth to live young after incubating eggs inside the female's body.
- **Distinction** - The new species differs from its congeners in bearing an elongate rostral appendage, green or ochre dorsum, orange-brown belly, and moderately keeled vertebral dorsal scale row.



Dudhwa Tiger Reserve

• Dudhwa Tiger Reserve, a protected area in Uttar Pradesh's Terai region.
• It encompasses Dudhwa National Park, Kishanpur Wildlife Sanctuary, and Katarniaghat Wildlife Sanctuary.
• **Established in -** 1988.
• **Rivers**
- The Sharda River flows by the Kishanpur WL Sanctuary,
- The Geruwa River flows through the Katarniaghat Wildlife Sanctuary and
- The Suheli and Mohana streams flow in the Dudhwa National Park, all of which are tributaries of the Ghagra River.
• The reserve is home to some of the last *remaining oxbow lakes,* along with marshy grasslands, dry riverine grasslands, and dense, moist deciduous sal woodlands.
• It is a biodiversity hotspot, where various flora and fauna are interconnected through food chains and food webs across different niches.
• Katarniaghat now has the *highest number of tigers* in Dudhwa Tiger Reserve.

Reference

The Hindu | Rare long-snouted vine snake

One Liners 09-04-2025

History, Art and Culture

Harit Yoga Initiative

Recently, the Minister of State for Ayush launched Harit Yoga.

• **Part of** – 10 Signature Events of International Day of Yoga (IDY) 2025.
• **Objective** – To encourage individuals to *plant trees as a symbolic act* of nurturing both *personal and planetary health*.
• More than 5000 medicinal plants were distributed amongst the Yoga enthusiasts.
• It *integrates yoga with environmental consciousness*.

International Day of Yoga 2025 *will be celebrated on 21st June 2025, with a theme of 'Yoga for One Earth One Health'.*

Social Issues

Antar Drishti

Recently, Antar Drishti was inaugurated in New Delhi.

• It is a *unique sensory dark room* specially designed to experience sensory space.
• **Launched by** – National Institute for the Empowerment of Persons with Visual Disabilities (NIEPVD) and National Association for the Blind (NAB).
• **Aims** – To raise awareness and sensitize society towards the challenges faced by persons with visual impairments.
• To foster empathy, understanding, and inclusion by *bridging the gap between perception and lived reality.*
• **Feature** – In this dark room, individuals experience complete darkness and engage in activities that help simulate the everyday experiences of persons who are blind or have low vision.

Enable Inclusion App

The National Institute for the Empowerment of Persons with Visual Disabilities (NIEPVD) will implement the Enable Inclusion App.

• It is a *digital platform* for early identification, intervention, and *tracking of children with developmental disabilities*.
• **Developed by** – Amar Seva Sangam.
• **Role** – It is expected to revolutionize early intervention, tele-counseling, tracking and rehabilitation planning.
• It is setting a *benchmark for inclusive practices* across India and beyond.
• It has been successfully used across various communities to *support intellectual and developmental needs*.

Economy

Quick Commerce (Q-Commerce)

Recently, Competition Commission of India has sought additional information on a complaint against quick commerce companies.

• **Q-Commerce –** It refers to *ultra-fast delivery services*, typically *within 10-30 minutes*.
• It is facilitated by an elaborate network of *dark stores* and/or distribution centres.
• It focusses on small, high-demand FMCG (Fast Moving Consumer Goods) products like groceries, snacks, and daily essentials.
• **For example –** Zepto, Swiggy Instamart, Blinkit among others.

Dark stores *refer to warehouses used by the platforms solely to fulfil online orders, with no in-person shopping.*

Ready Reckoner (RR) Rates

The Maharashtra government recently increased the ready reckoner (RR) rates across the state.

• It is the *minimum value* at which a property must be registered during a transaction.
• **Determined by** – State government.
• **Features** – It serves as a reference for calculating *stamp duty and registration charges*.
• It ensures *uniformity and transparency* in property transactions, and acts as a safeguard against underreporting.
• It is also known as the *Circle Rate or Guidance Value* in some states.

Special Additional Excise Duty (SAED)

Recently, the Union government raises SAED on petrol and diesel by ₹2 per litre each after a gap of 34 months.

• **Excise duty** – It is a *tax on the manufacture or production* of goods within the country.
• **Special Additional Excise Duty** – It is an *additional tax* imposed on top of the basic excise duty.
• It is levied to *shore up government revenue*.
• Thus, the net effective excise duty will increase to Rs.13 per litre for petrol and Rs.10 per litre for diesel.

Environment

New Species of Trapdoor Spiders

A team of scientists from the University of Western Australia recently discovered 2 new species of trapdoor spiders.

• **Discovered in** – Kimberley region, marking the 1st recorded discovery of this spider group in northern Australia.
• **2 new species** – *Kwonkan fluctellus* and *Kwonkan nemoralis*.
• **Unique features** – Highly *specialized burrow construction*, which creates elaborate burrow entrances.
• **Burrows constructed by Kwonkan nemoralis** – It had a little *collapsible silken collar* around the entrance, which had grains of sand embedded in it.
• When it was disturbed, the collar around the burrow's entrance collapses & seals the entrance, which blends with the surrounding landscape, making it *virtually invisible to predators*.

Security

Mi-17 V5 helicopters

Recently, the Ministry of Defence has signed a contract with Bharat Electronics Limited for acquisition & installation of Electronic Warfare (EW) suites and aircraft modification kits on Mi-17 V5 helicopters.

• It is a *Russian made aircraft* purchased for the Indian Air Force (IAF).
• **Role** – It is designed to *carry personnel, cargo and equipment* inside the cargo cabin or on an external sling.
• **Features** – Night vision technology, on-board weather radar, a new PKV-8 autopilot system, and a KNEI-8 avionics suite which helps reduce pilot workload.
• **Top speed** – *250 kilometers* per hour.

Science

Healthy Beginnings, Hopeful Futures' Campaign

Recently, 'Healthy beginnings, hopeful futures' campaign was launched as a part of World Health Day (April 7, 2025).

• It is a year-long campaign on *maternal and newborn health*.
• **Launched by** – World Health Organization (WHO).
• **Objective** – To urge the governments and the larger medical community to ramp up efforts to *end preventable maternal and newborn deaths.*
• To prioritise *women's longer-term health* and well-being.

Y2K Bug Crisis

Recently, the Minister of Commerce & Industry recalled how Indian IT sector leveraged the Y2K bug crisis of late 1990s, to mark IT sectors emergence on the global stage.

• **Y2K bug** – It was a *computer flaw, or bug* emerged due to the erstwhile practice followed in computer to store the dates in two-digit format.
  - For instance, to refer 1970, the number "19" was left out and only the number '70' was used.
• Engineers shortened the date because data storage in computers was costly and took up a lot of space.
• **Issue** – As the year 2000 approached, computer programmers realized that computers might not interpret 00 as 2000, but as 1900.
• Y2K stands for *Year 2000, where letter 'k'* is commonly used to represent the *number 1,000*.
• It is also known as the *Millennium Bug*.

<

SHANKAR IAS PARLIAMENT
Information is Empowering