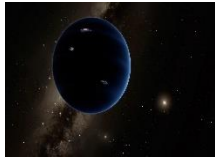## WHAT IS PLANET NINE?

Astronomers have been scouring the outer solar system for signs of a hypothetical ninth planet for almost a decade, without success. However, we may finally be on the cusp of finding it, experts say.

- Planet Nine is a **hypothetical planet** in the **outer region of our solar system.**
- The concept was proposed to explain certain anomalies observed in the orbits of distant **trans-Neptunian objects (TNOs),** particularly those with highly elliptical and clustered orbits.

Characteristics:

- **Mass**: Estimated to be about **5 to 10 times that of Earth.**
- **Orbit**: Believed to have a highly elliptical orbit with a semi-major axis of about 400 to 800 AU **(astronomical units)**.
  - One AU is the average distance between Earth and the Sun, roughly **93 million miles or 150 million kilometres.**
- **Orbital Period**: Could range from 10,000 to 20,000 years.
- **Distance**: At its closest, it might be around 200 AU from the Sun, and at its farthest, about 1,200 AU.
- The hunt for the solar system's potential ninth planet may soon be coming to a close. With the opening of the groundbreaking **Vera C. Rubin Observatory in 202**5, we may either finally find Planet Nine within the next few years — or rule out the idea for good.

JIMEX EXERCISE-24

Recently, JIMEX exercise–24 commenced at Yokosuka in Japan.

- This is the **eighth edition of JIMEX**, since its **inception in 2012.**
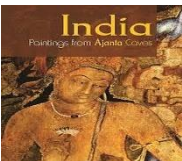- The exercise includes **both harbour and sea phases.**

o The harbour phase will comprise professional, sports and social interactions.

- During the exercise, navies of both the countries will jointly hone their **war fighting skills at sea and enhance their interoperability.**

- Indian Navy's indigenous **Stealth Frigate INS Shivalik** is participating in the bilateral maritime exercise. Japan is being represented by the **Guided Missile Destroyer JS Yugiri.**

- It provides an opportunity to learn from each other's best practices and facilitates operational interactions between India and Japan.

- The exercise also reaffirms their **shared commitment towards maritime security in the Indo-Pacific region.**

Other Exercises between India and Japan:

o **Malabar:** India and Japan with the United States and Australia participate in the naval war gaming exercise named Malabar.

o **SHINYUU Maitri** (Air Force)

o **Dharma Guardian** (Military Exercise)

AJANTA PAINTINGS

Some of Ajanta paintings housed inside the Ajanta Gallery of Telangana State Museum in hyderabad are being restored with the collaboration of Noor International Microfilm Centre and the Department of Heritage Telangana.

The Ajanta caves, an archaeological site consisting of around 30 rock cut caves, situated in **Aurangabad (Maharashtra).**

o The unfinished caves, of which five (caves 9, 10, 19, 26 and 29) are **chaitya grihas** (sanctuary) and the rest, **sangharamas or viharas (monastery).**

- The caves at Ajanta are excavated out of a vertical cliff above the left bank of the **river Waghora** in the hills of Ajanta.

- These are masterpieces of **Buddhist religious** art that influenced Indian art that followed.

- **The caves were built in two phases-**

  - **The first period** spans the second and first centuries BCE, attributed the patronage of the Satavahana Dynasty and it is dominated by **Hinayana/Theravadin followers** of Buddhism.

  - **The second** was during the late fifth CE, possibly during the reign of the Vakataka king Harisena.It is dominated by the **Mahayana** followers of Buddhism.

- **Its features:**

  - These paintings were **painted in the tempera style** and filled with stories and illustrations of human figures, alive with drama.

  - Outlines were usually drawn using **red ochre or carbon black**, while organic substances such as plant fibres, plant seeds and rice husks were mixed into mud to create a mortar.

  - The first period depict **floral patterns, geometrical shapes**, animals and birds. Religious motifs are notably absent.

  - Murals from the second period depict iconic scenes from the **Jatakas**, including Asita's visit to the infant Buddha, the temptation of Buddha by Mara and his forces, miracles performed by the Buddha and various scenes of battle and hunting etc.

DIVYA DRISHTI AI TOOL

A Woman-led Start-up Developed 'Divya Drishti', a cutting-edge AI Tool for Personal Identification, under a Technology Development Fund.

- The AI tool "Divya Drishti" **integrates face recognition** with immutable physiological parameters such as **gait and skeleton.**

- o It was developed by **Ingenious Research Solutions Pvt Ltd.,** a start-up established by a woman entrepreneur, **Shivani Verma**.
- This innovative solution marks a significant advancement in biometric authentication technology, offering enhanced accuracy and reliability in identifying individuals.
- This **dual approach** enhances identification accuracy, **minimizing** the risk of false positives or identity fraud and has versatile applications across diverse sectors including Defence, Law Enforcement, Corporate and Public Infrastructure.
- The AI tool has been developed under the **technical guidance** and mentoring of the **Centre for Artificial Intelligence & Robotics** (CAIR), a laboratory of DRDO based in Bangalore.

The Technology Development Fund (TDF):

- The TDF scheme is a flagship programme of the **Ministry of Defence** executed by **DRDO** under **'Make in India'**
- It grants aid for defence and dual-use technology development.
- **Objectives:** To build Indian industries' **capacity and capability** for defence technology development, foster a culture of design and development, and create an R&D ecosystem.
- It supports **niche technology** development, and **prototype creation,** and achieves **'Aatmanirbharta'** in defence technology.

DIGITAL HEALTH INCENTIVE SCHEME (DHIS)

The central government has given a year-long extension to the Digital Health Incentive Scheme (DHIS) meant for digitising patients' health records and linking them with the Ayushman Bharat Digital Health Account (ABHA ID).

- The Digital Health Incentive Scheme (DHIS) is a national initiative by the **National Health Authority (NHA)** aimed at promoting the adoption of digital health practices in India.

- It was launched on January 1, **2023**, under the **Ayushman Bharat Digital Mission** (ABDM) to create a robust digital health ecosystem and enhance the quality of care for patients.
- With this **extension**, the scheme will now remain in effect till June 30, **2025**.

Key Features and Objectives:

- **Eligibility**: Health facilities (hospitals, diagnostic labs), digital solution companies, and other healthcare providers are eligible to participate in the scheme.
- **Incentives** are provided based on the number of digital health records created and linked to Ayushman Bharat Health Account (ABHA) numbers of patients.
- Healthcare institutions and digital solution entities can register for the scheme through the **Health Facility Registry** (HFR) and **ABDM Sandbox**, respectively.
- **Transactions that qualify** under the scheme include creating any ABHA-linked health record, such as teleconsultations, lab reports, prescriptions, etc.

Objectives and Impact:

- **Promote digital health:** The scheme aims to encourage healthcare providers to adopt digital health practices, enhancing patient care and reducing administrative burdens.
- **Enhance quality of care:** By digitizing health records, the scheme ensures evidence-based quality care and seamless access to patient records.
- **Boost digital health transactions:** The scheme aims to increase digital health transactions, which will help in creating a robust digital health ecosystem.

National Health Authority (NHA):

- It is the **apex body** responsible for implementing **AB PM-JAY.**
- It has been entrusted with the role of designing strategy, building technological infrastructure and implementation of **"National Digital Health Mission "** to create a National Digital Health Ecosystem.

- It is the **successor of the National Health Agency**, which has been functioning as a registered society since 2018.
  o Under the Cabinet decision for full functional autonomy, the National Health Agency was reconstituted as the National Health Authority in January 2019.

LIQUID IMPROVISED EXPLOSIVE DEVICE

- It is a type of **unconventional explosive weapon** that can take any form and be activated in a variety of ways.
- They are used by **criminals, vandals, terrorists, suicide bombers and insurgents**.
- Because they are improvised, IEDs can come in many forms**, ranging from a small pipe bomb to a sophisticated device** capable of causing massive damage and loss of life.
- The extent of damage caused by an IED depends on its size, construction, and placement, and whether it incorporates a high explosive or propellant.
- The term IED came into common usage during the **Iraq War** that began in 2003.

Components of an IED:
  o All IEDs consist of an initiating mechanism: **a detonator, an explosive charge and a casing or collection of projectiles** (such as ball bearings or nails) that produces lethal fragments upon detonation.

Materials used as explosives in IEDs:
  o In practice, IEDs can be made of many different kinds of objects and materials, including **artillery or mortar rounds, aerial bombs, certain types of fertilizers, TNT and other explosives.**
  o IEDs can also contain radiological, **chemical or biological components to increase their lethal and psychological effects.**

DIGITAL AGRICULTURE MISSION

Need for Digitization of Agriculture in India:

- According to the NITI Aayog research on artificial intelligence, agriculture must expand at a rate of 4 per cent or higher right now to maintain an annual growth rate of 8–10 per cent.
- Digitization is crucial for achieving this level of success.
- AI currently helps farmers increase yield by assisting them in choosing better crops, hybrid seeds, and resource-efficient farming techniques.
- It is also utilised to improve farming productivity and accuracy to assist farmers in creating seasonal forecasting models

About Digital Agriculture Mission:

- The Digital Agriculture Mission 2021–2025 aims to **encourage and speed up projects based on cutting-edge technologies, including AI, blockchain, remote sensing, robots, and drones**.
- A comprehensive ICT strategy has, therefore, been developed to reach out to farmers in an easy and better way.
- The strategy also aims for planning and monitoring of schemes so that policy decisions can be taken at a faster pace and farmers can be benefited quickly.
- **To empower different sections of rural areas, different ICT strategies have been devised**:
  - Those who have access to **digital infrastructure** can get the information through websites/web portals.
  - Those who have **smart phones** can access the same information through mobile apps.
  - Those who have basic phones, can get this information through **SMS advisories** sent by experts.
  - To get the personalized information; farmers can call at the toll-free number of **Kisan Call Centre**.

Implementation & Budget of the Mission:

- **Implementation**:
  - The launch of the mission was initially planned in 2021-22 but due to Covid-19 outbreak, it could not be rolled out nationally.
  - Meanwhile, the Agriculture ministry started various pilot projects and activities across several states, which are part of the mission.
  - A pilot project has been undertaken across 6 districts — Farrukhabad in Uttar Pradesh, Beed in Maharashtra, Gandhinagar in Gujarat, Fatehgarh Sahib in Punjab, and Virudhunagar in Tamil Nadu.
  - In Farrukhabad, the UP government has already generated unique IDs for over 1.5 lakh farmers.

- **Budgetary Allocation**:
  - A budgetary allocation of **Rs 2,800 crore** has been made for the mission and it will be rolled out over the next two years (till 2025-26).

WHAT IS A DIGITAL FIREWALL?

- A digital firewall is a **software-based network security device** that **monitors and filters** network traffic based on predefined security rules.
- It is designed **to prevent unauthorized access** to a network by controlling incoming and outgoing traffic.
- Digital firewalls can be **installed on individual devices, such as computers or servers**, and are often used in conjunction with **other security measures** like antivirus software to provide comprehensive protection against cyber threats.
- Though in recent times they are **associated with censorship by oppressive governments,** firewalls were meant to be a security tool.

- Large firewalls like the **Great Firewall of China**, for example, are highly complex cybersecurity tools maintained at scale to prevent people from accessing large sections of the Internet.
    - o That means nation-states can entirely stop citizens from accessing the most commonly used websites on the Internet, eg. social media.