WHAT IS A NEBULA?

- A nebula is a **giant cloud of dust and gas in space.**

- Some nebulae (more than one nebula) come from the gas and dust thrown out by the explosion of a dying star, such as a **Supernova.**

- Other nebulae are regions where new stars are beginning to form. For this reason, some nebulae are called "star nurseries."

- **How do stars form in a nebula?**
  - Nebulae are made **of dust and gases—**mostly **hydrogen and helium.**
  - The dust and gases in a nebula are very spread out, but gravity can slowly begin to pull together clumps of dust and gas.
  - As these clumps get bigger and bigger, their gravity gets stronger and stronger.
  - Eventually, the clump of dust and gas gets so big that it collapses from its own gravity. The collapse causes the material at the center of the cloud to heat up-and this hot core is the beginning of a star.

- **Nebulae exist in** the space between the stars—also known as **interstellar space.**

- The **closest known** nebula to Earth is called the **Helix Nebula.** It is approximately 700 light-years away from Earth.

- Nebulas come in many shapes and sizes and can be further divided into several subcategories, including planetary nebulas, supernova remnants, dark nebulas, and emission nebulas.

Red Spider Nebula:

- It is a **planetary nebula** located 3,000 light-years from **Earth and can be found in the constellation of Sagittarius.**

- It harbours one of the hottest stars known, which heats the gas around it to form shockwaves 62 billion miles (100 billion km) high.

NEW CYBERSECURITY INITIATIVES

- **Cyber Fraud Mitigation Centre (CFMC):**
- CFMC has been established at the **Indian Cybercrime Coordination Centre (14C) in New Delhi** with representatives of major banks, Financial Intermediaries, Payment Aggregators, Telecom Service Providers, IT Intermediaries, and States/UTs Law Enforcement Agencies (LEAs).
- They will work together **for immediate action and seamless cooperation to tackle online financial crimes.**
- CFMC will serve as an example of "**Cooperative Federalism**" in law enforcement.
- **Samanvaya Platform (Joint Cybercrime Investigation Facilitation System**): It is a web-based module to act as a **One Stop Portal for data repository of cybercrime**, data sharing, crime mapping, data analytics, cooperation, and coordination platform for LEAs across the country.

'Cyber Commandos' Program:

- Under this program, a **special wing of trained 'Cyber Commandos' in States/UTs** and **Central Police Organizations (CPOs)** will be established to counter threats of the cyber security landscape in the country.
- **Suspect Registry**: It is a new initiative to strengthen **fraud risk management** by creating a registry of identifiers based on the National Cybercrime Reporting Portal in collaboration with banks and financial intermediaries.

Key Facts about Indian Cyber Crime Coordination Centre (I4C):

- I4C has been established **under the Ministry of Home Affairs (MHA)** to deal with cybercrime in the country in a coordinated and comprehensive manner.

- The I4C focuses on tackling issues related to cybercrime for citizens, including improving coordination between various LEAs and stakeholders.
- The centre is **located in New Delhi.**
- **Functions:**
  - To act as a **nodal point** in the **fight against cybercrime.**
  - Identify the research problems and needs of LEAs and **take up R&D activities** in developing new technologies and forensic tools in collaboration with academia/research institutes within India and abroad.
  - To **prevent misuse of cyberspace** for furthering the cause of extremist and terrorist groups.
  - **Suggest amendments**, if required, **in cyber laws** to keep pace with fast-changing technologies and international cooperation.
  - To coordinate all activities related to the implementation of Mutual Legal Assistance Treaties (MLAT) with other countries related to cybercrimes in consultation with the concerned nodal authority in MHA.
- I4C **brings together academia, industry**, **public** and **government** in the prevention, detection, investigation, and prosecution of cybercrimes.
- I4C has **envisaged the Cyber Crime Volunteers Program** to bring together citizens with passion to serve the nation on a single platform and contribute to fight against cybercrime in the country.

COMMISSION FOR SCIENTIFIC AND TECHNICAL TERMINOLOGY

It was set up in December 1960, to evolve and define **scientific and technical terms in Hindi** and all Indian languages.

- It was established under **clause (4) of Article 344** of the Constitution of India.
- It is functioning under the **Department of Higher Education**, Ministry of Education, Government of India with its **headquarters in New Delhi.**

- **Primary Function:** Evolve standard terminology, propagate its use and distribute it widely.
- **Other functions:**
  - Preparation and Publication of **Bilingual and Trilingual Glossaries** involving English/Hindi and other Indian Languages.
  - Preparation and Publication of National terminology.
  - **Identification and Publication of School Level Terminology** and Departmental Glossaries.
  - Identification of Pan-Indian Terms.
  - Preparation of Definitional Dictionaries and Encyclopaedias.
  - Preparation of university-level textbooks, monographs and journals.
  - Grant-in-Aid to Granth Academies, Textbook Boards and University Cells for University level books in regional languages.
  - Propagation, expansion and critical review of terms coined and defined through training/orientation programmes, workshops, seminars etc.
  - Providing necessary terminology to the **National Translation Mission.**

Recent initiative of Commission for Scientific and Technical Terminology

- It has launched the **web portal 'shabd.education.gov.in'** aims to be a central repository for all the terminologies prepared for Indian languages.
- Besides all the glossaries of CSTT, other institutions or agencies having such dictionaries are also able to host their work in digital form on this platform.

ANUSANDHAN NATIONAL RESEARCH FOUNDATION (ANRF)

- The ANRF has been established with the Anusandhan National Research Foundation (ANRF) Act 2023 and as per recommendations of the National Education Policy (NEP) 2020.
- **It will act as an apex body** to provide high-level strategic direction of scientific research in the country.

- **It aims to seed, grow and promote R&D** and foster a culture of research and innovation throughout India's universities, colleges, research institutions, and R&D laboratories.

- **It 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.

- 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.

Governing Board and Executive Council of the ANRF:

- **The Governing Board of the ANRF:**
  - It is headed by the Prime Minister of India to provide strategic direction to the Foundation and monitor the implementation.
  - Other members of the Board are:
    - The Union Ministers of Science and Technology, Education as Vice Presidents,
    - The Principal Scientific Advisor as Member Secretary, and
    - Secretaries to the Departments of Science and Technology, Biotechnology, and Scientific and Industrial Research.

- **Executive Council:**
  - The Executive Council of the ANRF undertakes implementation and its functions include:
    - Considering applications for the grant of financial assistance,
    - Prescribing regulations regarding applications for financial assistance,
    - Preparing the budget of the Foundation and maintaining its accounts, etc.
  - The Principal Scientific Advisor will be the chairperson of the Council.

WHAT IS THE NATIONAL INSTITUTE RANKING FRAMEWORK (NIRF)?

- **About:**
  - The NIRF was launched by the Ministry of Human Resource Development (now **Ministry of Education**) in **2015** (first edition came in 2016).
  - The framework, which is the **first-ever effort** by the Government of India, **outlines a methodology** to rank HEIs across the country.
  - While participation in the NIRF was initially voluntary, **it became mandatory** in 2018 for all government-run educational institutions.

- **Ranking parameters:**

  - **Significance:**
    - The NIRF process gives **detailed feedback regarding a HEI's strengths and weaknesses.**
    - It assists institutions in gaining a better understanding of their **annual performance as well as their competitors** and peer performers.
    - This provides benefits such as **attracting industry for better placement** and serving as a **credible resource for parents** and students to learn about the HEIs.
    - The NIRF indirectly assists top-performing institutions in **building their brand and gaining widespread recognition** without incurring additional marketing and branding costs.

- **How to improve NIRF Ranking?**

PARLIAMENTARY COMMITTEE ON OFFICIAL LANGUAGE

Recently, the Union Home Minister was unanimously re-elected the Chairperson of the Parliamentary Committee on Official Language.

- The Parliamentary Committee on Official Language was constituted under the provisions of Section 4 of the **Official Languages Act, 1963**, in the year 1976.
  - Section 4 of the Act says "There shall be constituted a Committee on Official language, on a resolution to that effect being moved in either House of Parliament with the previous sanction of the President and passed by both Houses".
- The Committee is **chaired by the Union Home Minister**, and has, in accordance with the provisions of the 1963 Act.
- Under the provisions of the 1963 Act, the panel submits its **report to the President**, who "shall [then] cause the report to be laid before each House of Parliament, and sent to all the State Governments".
- **Purpose of the committee**
  - To **review the progress** made in the **use of Hindi for official purposes**, and to make recommendations to increase the use of Hindi in official communications.
- **Members:** It comprises **30 members** of Parliament, of which 20 are from the **Lok Sabha** and 10 from the **Rajya Sabha.**

UKAI DAM

The Ukai Dam, constructed across the **Tapti River**, is the **second largest reservoir in Gujarat after the Sardar Sarovar.**

- It is also known as **Vallabh Sagar.**
- Constructed in 1972, the dam is meant for irrigation, power generation, and flood control.

- The storage capacity of the Ukai dam is almost 46% of the total capacity of all the other existing dams in Gujarat if put together.
- Having a catchment area of about 62,255 km^2 and a water spread of about 52,000 hectares, **its capacity is almost the same as that of the Bhakra Nangal Dam.**
- Ukai dam is an **earth-cum-masonry dam**, the embankment wall of which is almost 4,927 meters long.
- Its earth dam is 80.77 meters high, whereas the masonry dam is 68.68 meters high.

Key Facts about Tapti River:
- It is one of the **major rivers in peninsular India**.
- It is one of the three major rivers (the other two being **the Narmada River and Mahi River), which flows in an east-to-west direction.**
- **Course:**
   - **Origin**: It rises in the **Gawilgarh Hills** of the **central Deccan plateau in south-central Madhya Pradesh state.**
   - It flows westward between two spurs of the Satpura Range, across the Jalgaon plateau region in Maharashtra state, and through the plain of Surat in Gujarat state to the Gulf of Khambhat (an inlet of the Arabian Sea).
   - **Total Length:** 435 miles (700 km).
- Its total catchment area is around 65145 sq. km., out of which **80% lies in the Maharastra region.**
- The basin of Tapi is surrounded by the Saputara mountain range in the north, the Ajanta and Satmala mountain ranges in the south, and the Mahadeva mountain range in the east.
- The Tapti flows roughly **parallel to the** longer **Narmada River** to the north, from which it is **separated by** the main part of the **Satpura Range.**
- **Major Tributaries**: The important tributaries of the river are **Purna** River, **Girna** River, **Panzara** River, Waghur River, Bori River, and Aner River.

WHAT IS MIKANIA MICRANTHA?

- It is a **perennial creeping climber** known for its vigorous and rampant growth. It is a **native of Central and South America.**
- It is a major invasive species in several parts of Southeast Asia, India and the Pacific Islands.
- It was introduced in India in the 1940s as ground cover in tea plantations and is now a serious threat to several plantation crops as well as forest areas all over the country.
- It grows best where **fertility, organic matter, soil moisture, and humidity are all high.**
- It damages or kills other plants by cutting out the light and smothering them.
  - It climbs up other plants to reach the canopy for better sunlight.
- Mikania is known to have allelopathic potential by producing biochemicals that can **inhibit seed germination and seedling growth of other plants.**
- It produces thousands of lightweight seeds that are wind-dispersed and also has the ability to reproduce vegetatively through its roots.

Key Facts about Bhadra Tiger Reserve (BTR):
- It is situated in the midst of the **Western Ghats region of Karnataka.**
- The reserve is unique as it is nestled within several hill ranges. The habitat has a good population of elephants and is also an **Elephant Reserve.**
- It boasts of a substantial tiger population, and as such, the sanctuary was declared the 25th Project Tiger Reserve of India in 1998.
- **Rivers**: It is well drained by the **river Bhadra and its tributaries.**
- **Vegetation**: It has **dry deciduous, moist deciduous**, **shola, and semi-evergreen**
- **Flora**: Teak, Rosewood, Mathi, Honne, Nandi, and many medicinal plants.
- **Fauna**: Tiger, Leopard, Leopard cat, Dholes, Indian Civet, ungulates like Gaur, Sambar, and Barking Deer are common.