Orbit Reduction Manoeuvre (ORM)

Context: India's ISRO has triumphantly executed the orbit reduction manoeuvre for Chandrayaan-3, its third lunar mission, a day post its lunar orbit insertion.

- Three additional moon-bound manoeuvres are scheduled by August 17, followed by detachment of the lander and rover from the propulsion module.
- Subsequent de-orbiting manoeuvres will precede the final moon descent, targeting a soft landing on August 23.

What is Orbital manoeuvre?

- An orbital manoeuvre, also referred to as a **burn**, involves utilizing propulsion systems to alter a spacecraft's orbit.
- When spacecraft are distant from Earth, like those in orbits around the Sun, the manoeuvre is termed a **deep-space manoeuvre (DSM),** although this assertion needs verification within the content.
- The subsequent phase of a flight, particularly during a transfer orbit, is known as **coasting**.

Aspect	Impulsive Maneuver	Non-Impulsive Maneuver
Description	Instantaneous change in velocity	Low thrust applied over a longer time
Mathematical Model	Idealized as instantaneous velocity change	Incorporates gradual momentum change
Real-world Feasibility	Not physically possible due to infinite force requirement	Achievable using continuous thrust
Practical Application	Approximates orbital changes for simplicity	Used when precise trajectory control is needed
Complexity Reduction	Simplifies trajectory calculations	Requires detailed spacecraft modeling
Burn Time	Tends to zero (ideal case)	Extended over a longer duration
Forces Involved	Large forces acting in an infinitesimally short time	Sustained, lower magnitude forces applied over time
Mission Types	Common for preliminary mission planning	Important for accurate space rendezvous
Example Propulsion Types	Chemical thrusters, impulse engines	Electric propulsion, ion thrusters

Various ways of Orbital Transfer

- **Hohmann Transfer Orbit**: Elliptical orbit for transitioning between circular orbits at different altitudes in the same plane.
- **Bi-Elliptic Transfer**: Manoeuvre using two half elliptic orbits for orbit change, potentially requiring less **delta-v (applied change in velocity of each manoeuvre)** than Hohmann transfer.
- **Low Energy Transfer**: Energy-efficient trajectory for orbit changes, taking longer but using minimal fuel.
- **Orbital Inclination Change**: Altering orbit inclination by changing velocity at orbital nodes; typically avoided due to high delta-v.
- **Constant-Thrust Trajectory**: Prolonged engine burn with constant thrust, requiring high acceleration over long periods.

Digital portal for Central Registrar of Cooperative Societies (CRCS)

Context: Union Home Minister Amit Shah launched CRCS digital portal in Pune, Maharashtra.

- The CRCS office in Pune, Maharashtra, is undergoing a comprehensive digital transformation.
- The initiative aims to promote ease of doing business in the cooperative sector and streamline various processes.

Objectives

- Implement paperless applications, ensuring automatic compliance with the Multi-State Co-operative Societies Act (MSCS Act) and rules through software.
- Enhance ease of doing business, facilitate digital communication, and ensure transparent processing.
- Improve analytics and management information system for better decision-making.

Project Highlights

- Facilitates the registration of new Multi-State Cooperative Societies in a simplified and efficient manner.
- Creates a transparent and digital ecosystem for cooperative operations.
- Incorporates advanced features for seamless processing and compliance.

Key Features of the Digital Portal

- **Comprehensive Modules**: The digital portal encompasses essential modules like registration, amendment of bye-laws, annual return filing, appeal, audit, and more.
- **Incorporation of Amendments**: Integrates recent changes to the Multi-State Cooperative Societies (MSCS) Act, ensuring compliance with the latest legal framework.
- **Efficient Electronic Workflow**: Accelerates application processing and service requests through an electronic workflow, promoting timely governance.
- **User-Friendly Registration and Validation**: Secure OTP-based user registration and validation checks ensure data protection and adherence to MSCS Act and Rules.
- **Seamless Video Conferencing and Communication**: Enables efficient dispute resolution via video conferencing and electronic communication channels for smooth interaction.

BharatNet

Context: The Union Cabinet sanctioned ₹1,39,579 crore for the upcoming phase of Bharat Net, extending 5G connectivity to remote regions.

Bharat Net Phase Expansion

- The Union Cabinet approved an allocation of ₹1,39,579 crore for the next phase of Bharat Net, aimed at extending 5G network coverage to remote areas.
- The project intends to employ a ring topology system, targeting 6.4 lakh villages within two years, up from the existing 1.94 lakh connected villages under the **Bharat Net Udyami Yojana.**
- The initiative is executed by the Special Purpose Vehicle (SPV) consisting of Bharat Broadband Network Limited (BBNL) and Bharat Sanchar Nigam Limited (BSNL) merger.

Pilot Project Achievements

- The pilot project covered 60,000 villages across four districts, completing within eight months.
- The rural consumption of 175 GB per household per month, compared to 230 GB in urban areas, has led to around 5.67 lakh active household connections.
- Small private companies serve as Internet Service Providers (ISPs) under a 50-50 revenue sharing model.

Infrastructure and Training

- Approximately 1,700 towers have been fiberized during the pilot project.
- Online training is provided for fibre maintenance and installation.
- The government bears the project's capital cost, and an automated message is triggered to the network operation centre in case of optical fibre damage.
- The project is expected to create around 2.5 lakh employment opportunities.

Expansion and Future Plans

- The pilot project achieved 3.51 lakh fibre connections purely through Bharat Net fibre, with BSNL contributing 1.3 lakh fibre connections monthly.
- The government aims to launch Bharat Net formally, offering packages priced at ₹399, ₹599, and ₹799, with online payment options for a fully digital process.

Government Investment

- The government has invested approximately $8.5 billion in the rural internet connectivity scheme.
- The scheme aims to provide fast broadband internet connectivity to all six lakh villages in the country.
- This announcement was made during the valedictory Session of the G20 Conference on Crime and Security in the age of NFTs, AI, and Metaverse.

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Current affairs summary for prelims

7 August, 2023

75 Endemic Birds of India: A report by ZSI

Context: On the 108th anniversary of the ZSI's foundation day, a publication named "75 Endemic Birds of India" was recently unveiled.

- A recent publication by the Zoological Survey of India (ZSI) emphasizes that 5% of birds found in India are endemic and not found elsewhere globally.
- The publication, titled "75 Endemic Birds of India," was launched on the occasion of the ZSI's 108th foundation day.

India's Unique Avian Diversity

- India is home to 1,353 bird species, accounting for around 12.40% of global bird diversity.
- Out of the total bird species, 78 (5%) are exclusive to India and are referred to as endemic.

Endangered and Rare Species

- Among the 78 endemic species, three have not been sighted in recent decades.
- **Manipur Bush Quail (Perdicula manipurensis),** 'Endangered,' last recorded in 1907.
- **Himalayan Quail (Ophrysia superciliosa),** 'Critically Endangered,' last seen in 1876.
- **Jerdon's Courser (Rhinoptilus bitorquatus),** 'Critically Endangered,' last confirmed sighting in 2009.

Geographic Distribution and Conservation

- The publication outlines that the 75 endemic bird species belong to 11 orders, 31 families, and 55 genera.
- The Western Ghats hosts the highest number of endemic species (28), followed by the Andaman and Nicobar Islands (25), and Eastern Himalayas (4).

Conservation Status

- Among the 78 endemic species, 25 are classified as 'Threatened' by the IUCN.
- 'Critically Endangered' species include **Bugun Liocichla**, Himalayan Quail, and Jerdon's Courser.
- The publication provides insights into the conservation status, etymology, historical relevance, traits, habitats, breeding habits, and more for each species.

Zoological Survey of India

- **Founded**: Established in 1916 under the Ministry of Environment, Forest and Climate Change.
- **Taxonomic Authority**: Renowned for expertise in species identification, classification, and nomenclature.
- **Biodiversity Records**: Conducts extensive surveys, documenting India's diverse fauna for scientific reference.
- **Ecosystem Research**: Explores species interactions and habitat dynamics, advancing ecological understanding.
- **Conservation Impact**: Informs policy and management decisions, contributing to sustainable resource utilization.
- It publishes the **Red Data Book on Indian Animals,** since 1983.

NEWS IN BETWEEN THE LINES

National Handloom Day

National Handloom Day

- National Handloom Day is an annual observance in India celebrated on 7th August.
- It commemorates the Swadeshi Movement launched on 7th August 1905, which advocated indigenous industries and promoted self-reliance.

9th National Handloom Day Celebration:

- PM Narendra Modi to join 9th National Handloom Day celebration at Bharat Mandapam, Pragati Maidan, Delhi.
- Unveiling the e-portal 'Bhartiya Vastra evam Shilp Kosh,' created by National Institute of Fashion Technology (NIFT).

Promoting Indigenous Textiles:

- Reinforces dedication to indigenous textiles and handlooms, aligned with the 'Vocal For Local' initiative.
- Significance in supporting local artisans and craftspeople.

Face to Face Centres

DELHI MUKHERJEE NAGAR: 9205274741, 42 | LAXMI NAGAR : 9205212500, 9205962002 | RAJENDRA NAGAR: 9205274743 | UTTAR PRADESH PRAYAGRAJ: 0532-2260189, 8853467068 | LUCKNOW (ALIGANJ): 0522-4025825, 9506256789 | LUCKNOW (GOMTI NAGAR): 7234000501, 7234000502 | GREATER NOIDA: 9205336037, 38 | KANPUR: 7887003962, 7897003962 | GORAKHPUR : 7080847474, 9161947474 | ODISHA BHUBANESWAR: 9818244644/7656949029

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Government's Support:

- PM Modi advocates policy support for artisans, preserving rich tradition of artistry and craftsmanship.
- Celebration reflects government's commitment to uplift handloom sector.

Indian Eagle-Owl

Indian Eagle-Owl:

- The Indian eagle-owl (Bubo bengalensis) is a nocturnal bird of prey found across the Indian subcontinent.
- It is recognized for its distinct physical attributes, with the female being slightly larger, measuring up to around 2.5 feet in length and boasting a wingspan of about six feet.

Recent Classification:

The Indian eagle-owl was classified as a distinct species in recent years, differentiating it from the Eurasian eagle-owl.

Habitat and Diet:

- The species thrives across the Indian peninsula and is adaptable to open scrublands and agricultural areas.
- It preys on rats, bandicoots, bats, doves, and more, which are commonly found in such habitats.

Defensive Behavior and Benefits to Agriculture:

- Indian eagle-owls show ferocious defensive behavior near their nesting areas, attacking intruders to protect their nests.
- Farmers benefit from their presence as they prey on rodents near agricultural lands, contributing to healthier crops.

Bhu-Vision

What is Bhu Vision?

- Bhu-Vision, also known as KRISHI-RASTAA Soil Testing System, is an innovative IoT-based automated soil testing and agronomy advisory platform.
- It is a collaborative creation of the Indian Council of Agricultural Research - Indian Institute of Rice Research (ICAR-IIRR) and KrishiTantra.

Efficient Soil Testing:

- Conducts 12 key soil parameter tests in 30 minutes.
- Provides quick, accurate results via soil health card on mobile devices to farmers and stakeholders.

Indian Institute of Rice Research (ICAR-IIRR):

Established as All India Coordinated Rice Improvement Project (AICRIP) by ICAR in 1965.

- **Headquarters:** Hyderabad.
- **Mandate:** Enhancing rice productivity, multi-location testing, technology dissemination, capacity building.

Supernova

What is Supernova?

- A supernova is a powerful stellar explosion that marks the end of a star's life cycle.
- It's one of the universe's most energetic events, releasing immense energy, radiation and elements.

Stellar Balance and Explosion:

- Stars balance nuclear fusion's energy with gravity's mass-pulling force.
- When fusion stops, gravity prevails, causing the star's outer layers to explode.

Types of Supernovae:

- **Core-Collapse Supernova:** Massive stars collapse due to fuel depletion, triggering an explosive release of energy.
- **Thermal Runaway Supernova:** Collision of stars, even white dwarfs, leads to a runaway reaction and powerful explosion.

Energy and Element Ejection:

Supernovae emit vast energy, radiation and elements into space. Crucial elements like gold and uranium, forming Earth's composition, originate in these events.

Cosmic Influence:

Heavy elements created in supernovae disperse into the universe, impacting celestial bodies' composition.

Supernovae shape the universe's evolution and contribute to celestial object formation.

What is the Ring Nebula?

The Ring Nebula is a celestial object known for its striking appearance. It's a glowing, donut-shaped cloud of gas and dust located in space.

Clouded Leopard

.Clouded Leopard:
The clouded leopard (Neofelis nebulosa) is a wild cat species inhabiting dense forests in the Himalayas, mainland Southeast Asia and South China.
Two species: Mainland clouded leopard (N. nebulosa) and Sunda clouded leopard (N. diardi) in Borneo, Sumatra.
Distinctive Traits of Clouded Leopard:
- Features the largest canines relative to skull size among all cat species.
- Possesses distinctive rotating rear ankles, facilitating headfirst tree descent and agile climbing, even hanging upside down on branches.

Diverse Habitats of Clouded Leopard:
- Favors habitats like evergreen tropical forests, secondary forests, logged areas, grasslands, mangrove swamps, and more.
- Spotted in Indian states including Sikkim, West Bengal, Meghalaya, Tripura, Mizoram, Manipur, Assam, Nagaland and Arunachal Pradesh.

Meghalaya's State Animal:
Clouded leopard is the State animal of Meghalaya.
IUCN Status: Vulnerable

Places in News

Lampedusa

Recently, in two separate migrant shipwrecks near the southern Italian island of Lampedusa, around 57 people were rescued, while over 30 are feared missing at sea.

Political Boundaries:
- Lampedusa is a part of Italy and falls under the administrative region of Sicily.
- It is located in the Mediterranean Sea, specifically within the Province of Agrigento in Sicily.

Geographical Features:
- Lampedusa is the largest island in the Pelagie Islands group.
- Lampedusa is known for its rugged coastline, featuring cliffs, rocky shores and sandy beaches.

Geopolitical Significance:
Lampedusa's location has geopolitical significance in discussions about migration, border control and international relations in the Mediterranean region.

POINTS TO PONDER

- **Which country's court has overturned a law banning Sikhs from carry a Kirpan at schools?** – Australia
- **Recently, Gummadi Vithal Rao passed away in Hyderababd. What was he renowned for?** – Balladeering and folk singing
- **What is the act of incorporating expensive features or refinements which tend to push the cost up for the services, called?** – Gold-plating
- **What is the device that is used to scan irises of the individuals for the Worldcoin Project called?** – The Orb
- **Which leader has been barred from contesting elections in the upcoming Presidential Election in Maldives?** – Abdullah Yameen