

SCIENCE AND TECHNOLOGY

❖ **The uncontrolled re-entries of satellites**

- **CONTEXT:** More than 140 experts and dignitaries have signed an open letter published by the Outer Space Institute (OSI) calling for both national and multilateral efforts to restrict uncontrolled re-entries (the phenomenon of rocket parts falling back to earth in unguided fashion once their missions are complete). Among others, the letter is addressed to S. Somanath, chairman of the Indian Space Research Organisation (ISRO).
- **What are the stages of a rocket launch?**
 - The Soviet Union launched the first artificial satellite in 1957. Today, there are more than 6,000 satellites in orbit, most of them in low-earth (100-2,000 km) and geostationary (35,786 km) orbits, placed there in more than 5,000 launches. The number of rocket launches have been surging with the advent of reusable rocket stages.
 - Rockets have multiple stages. Once a stage has increased the rocket's altitude and velocity by a certain amount, the rocket sheds it. Some rockets jettison all their larger stages before reaching the destination orbit; a smaller engine then moves the payload to its final orbit. Others carry the payload to the orbit, then perform a deorbit manoeuvre to begin their descent. In both cases, rocket stages come back down (in controlled or uncontrolled ways).
- **What is an uncontrolled re-entry?**
 - In an uncontrolled re-entry, the rocket stage simply falls. Its path down is determined by its shape, angle of descent, air currents and other characteristics. It will also disintegrate as it falls. As the smaller pieces fan out, the potential radius of impact will increase on the ground.
 - Some pieces burn up entirely while others don't. But because of the speed at which they're travelling, debris can be deadly.
 - According to a 2021 report of the International Space Safety Foundation, "an impact anywhere on an airliner with debris of mass above 300 grams would produce a catastrophic failure, meaning all people on board would be killed.
 - Most rocket parts have landed in oceans principally because earth's surface has more water than land. But many have dropped on land as well.
- **Why are scientists worried about the re-entries?**
 - The OSI letter cited examples of parts of a Russian rocket in 2018 and China's Long March 5B rockets in 2020 and 2022 striking parts of Indonesia, Peru, India and Ivory Coast, among others. Many reports have focused on Chinese transgressions of late, but historically, the U.S. has been the worst offender.
 - Parts of a SpaceX Falcon 9 that fell down in Indonesia in 2016 included two "refrigerator-sized fuel tanks". If re-entering stages still hold fuel, atmospheric and terrestrial chemical contamination is another risk.
 - As per the letter, "Conservative estimates place the casualty risk from uncontrolled rocket body re-entries as being on the order of 10% in the next decade" and that countries in the 'Global South' face a "disproportionately higher" risk of casualties.
 - The U.S. Orbital Debris Mitigation Standard Practices (ODMSP) require all launches to keep the chance of a casualty from a re-entering body to be below 0.01%. But the U.S. Air Force and the NASA have waived this requirement on multiple occasions.
 - A July 2022 study by researchers in Canada found that this threshold, which some other countries have also adopted, is "arbitrary and makes little sense in an era when new technologies and mission profiles enable controlled re-entries," and because many places have become more densely populated.
 - There is no international binding agreement to ensure rocket stages always perform controlled re-entries nor on the technologies with which to do so. The Liability Convention 1972 requires countries to pay for damages, not prevent them. These technologies include wing-like attachments, de-orbiting brakes, and extra fuel on the re-entering body, and design changes that minimise debris formation.
- **What can make minimum damage?**
 - While the OSI letter admits that any kind of re-entry will inevitably damage some ecosystem, it recommends that bodies aim for an ocean in order to avoid human casualties.
 - The letter concludes by asking that future solutions be extended to re-entering satellites as well. Advances in electronics and fabrication have made way for smaller satellites, which are easier to build and launch in large numbers. These satellites experience more atmospheric drag than if they had been bigger, but they are also likelier to burn up during re-entry.
 - India's 300-kg RISAT-2 satellite re-entered earth's atmosphere in October 2022 after 13 years in low-earth orbit. The ISRO tracked it with its system for safe and sustainable space operations management from a month beforehand. It plotted its predicted paths using models in-house. The RISAT-2 eventually fell into the Indian Ocean on October 30.

POLITY

❖ **What do the J&K Land Grants Rules, 2022 entail?**

- **CONTEXT:** The J&K Lieutenant Governor's administration, notified fresh land rules under J&K Land Grant Rules-2022 and replaced the J&K Land Grants Rules-1960, which dealt with the special rules to grant government land on lease in erstwhile State of J&K.

- Under the previous rules, prime locations such as Srinagar, Jammu, Gulmarg and Pahalgam were opened up for construction of hotels, commercial structures and residential buildings in the past. These land laws were considered as the backbone of J&K's upper middle class and allowed a new chain of hotels and commercial structures to come up in prime locations, including places like Pahalgam and Gulmarg over the years.
- J&K L-G Manoj Sinha, however, argued that amendments were needed because the previous land laws were "regressive". He also targeted the present land holders as one "who just paid ₹5 to enjoy profit from ₹100 crore property". However, local land holders see the move as one which has opened the gateway "to outsiders to buy prime properties in J&K".
- **What do new land laws entail?**
 - According to the new land laws, the leases of current land owners will not be extended in case of their lease expiry. It reads that all leases, except the subsisting or expired residential leases, expired or determined prior to the coming into force of these rules or issued under these rules shall not be renewed and shall stand determined.
 - Unlike the previous up to 99 years of lease, the lease period has been reduced to 40 years. The government has asked the outgoing lease holders to evict properties or else face evictions under the new rules.
 - However, the current land holders termed these rules "exclusive to J&K where the first right to lease-holders has not been granted and revised rates negotiated".
- **What is the L-G administration's plan for lease now?**
 - An expert committee will enlist all properties where lease had ended. It will be e-auctioned afresh.
 - The rules open bidding to "any person legally competent under Section 11 of the Indian Contract Act, 1872.
 - These rules deem a person or an entity in default of Government Revenue accrued to the government under J&K Land Grant Act, 1960 or Government convicted under Prevention of Money Laundering Act, 2002 shall not be eligible for participation in the auction.
 - According to now-repealed land laws, no such land shall be granted on lease to the person, who is not a permanent residence of the State; except where the Government, for the reasons to be recorded, relax this restriction in the interest of industrial or commercial development or in the favour of a registered charitable society.
- **Who all are eligible for lease rights in J&K after amendments?**
 - The L-G administration has diversified the use of land on lease to education, healthcare, agriculture, tourism, skill development and development of traditional art, craft, culture and languages.
 - The land could be leased for hydro-electric projects, stadiums, playgrounds, gymnasiums or other recreational purposes.
 - It also included provisions for self-employment or for housing purposes of ex-servicemen, war widows and the families of martyrs, one who has sacrificed his life in the line of duty.
 - In a first, the land could also be used for facilities of migrant workers, buildings and other construction workers.
- **What will be the immediate impact of the amendments?**
 - The new rules have hundreds of properties open for fresh auction, where outsiders could also participate. The government has not yet released the list of properties where lease has ended.
 - The impact will be of great significance in tourist hotspot Gulmarg, where 56 hotels out of 59 have their leases expired already. Similarly, properties in Pahalgam, Srinagar and Jammu's Patnitop will go up for auction.

PRELIMS

1. Nai Roshni Scheme

- **CONTEXT: The Minister of Minority Affairs, Smt. Smriti Zubin Irani in a written reply to a question in the Lok Sabha informed that during the last three years, i.e., 2019-20 to 2021-22, around 40,000 women have been trained all over India including 175 in Bihar.**
- Nai Roshni scheme has now been merged as a component of Pradhan Mantri Virasat Ka Samvardhan (PM VIKAS) scheme w.e.f FY 2022-23, aiming to improve livelihoods of minorities, particularly artisan communities, through skill development, education and leadership training, to support their entrepreneurship interventions.
- **About**
 - Nai Roshni-a Leadership Development Programme for Minority Women is a Central Sector Scheme for women belonging to minority communities in the age group of 18 to 65 years.
 - It was started in 2012-13.
 - The objective of the scheme is to empower and instil confidence among minority women, including their neighbours from other communities living in the same village/locality, by providing knowledge, tools and techniques for interacting with Government systems, banks and other institutions at all levels.
 - It is run with the help of NGOs, Civil societies and Government Institutions all over the country.
 - It includes various training modules like Leadership of women, Educational Programmes, Health and Hygiene, Swachh Bharat, Financial Literacy, Life Skills, Legal Rights of Women, Digital Literacy and Advocacy for Social and behavioral change.
- **Significance**

- Empowerment of women per se is not only essential for equity, but also constitutes a critical element in our fight for poverty reduction, economic growth and strengthening of civil society.
- Women and children are always the worst sufferers in a poverty stricken family and need support. Empowering women, especially mothers, is even more important as it is in homes that she nourishes, nurtures and molds the character of her offspring.
- It helps embolden minority women to move out of the confines of their home and community and assume leadership roles and assert their rights, collectively or individually, in accessing services, facilities, skills, and opportunities besides claiming their due share of development benefits of the Government for improving their lives and living conditions.

2. **Mahila Coir Yojana (MCY)**

➤ **CONTEXT: Union Minister of State for MSME Shri Bhanu Pratap Singh Verma in a written reply in Lok Sabha gave information about this yojana**

➤ **About**

- Ministry through Coir Board, a statutory body is implementing various skill development activities across the country under the component 'Skill Upgradation & Mahila Coir Yojana' of Coir Vikas Yojana, a Central Sector Scheme.
- Among the various skill development programmes under Coir Vikas Yojana, the Scheme Mahila Coir Yojana (MCY) envisages provision for training only to women artisans.
- MCY is being implemented by the Coir Board for the empowerment of women artisans in the coir sector with an aim to provide self employment opportunities to rural women artisans in regions processing coconut husk and provides scope for large scale employment as well as improvement of standard of living of rural women artisans.
- The scheme is prevalent in coir producing coastal States such as Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Odisha, Lakshadweep, Maharashtra, Gujarat, Goa, Puducherry, A& N Islands, West Bengal and NE Region.
- The main objectives of the scheme are as under:
 - ✓ To train the personnel artisans in the cadres of Supervisors/ Instructors/ Artisans and to meet the requirement of skilled man power for the development of coir industry.
 - ✓ Help in transfer of technology to non-traditional areas through development of skill of coir workers.
 - ✓ Assisting the MCY trained women artisans for procuring spinning equipments/coir processing machineries from the PMEGP.
 - ✓ To inculcate quality consciousness among workers at grass root level and to educate them on proper methods of producing standard quality fibre, yarn and products.
- The Coir Board has done an evaluation study during the year 2020. In the study, it is found that income of rural women has been increased significantly after getting training under MCY. The production of coir has increased and enabled the women spinners to earn a higher income.
- Apart from Mahila Coir Yojana, Coir Board is also implementing various skill development activities under Coir Vikas Yojana, across the country like Training in Value Added Products, regular training Courses, Awareness Programme, etc. for making the rural women artisans/ unskilled labourers aware of the working of coir units and improving their skills and thereby motivating them for setting up of their own coir units or coir based industries by availing the assistance under the Scheme PMEGP.

3. **Ayushman Bharath Digital Mission (ABDM)**

➤ **CONTEXT: The National Health Authority (NHA) has announced a Digital Health Incentive Scheme (DHIS) for the stakeholders of the digital health ecosystem. NHA aims to promote adoption of Ayushman Bharat Digital Mission (ABDM) by offering incentives of up to Rs. 4 crores to hospitals, labs and digital health solution providers**

➤ **About**

- Ayushman Bharath Digital Mission is a component of the Ayushman Bharat scheme.
- It is a flagship program of India that was introduced by the National Health Policy 2017's recommendations to achieve the goal of Universal Health Coverage (UHC).
- It was launched in September 2021 by the Prime Minister through a video conference. The Union Cabinet has approved the nationwide implementation with the budgetary allocation of Rs 1,600 crore for five years.

➤ **Components**

- Health ID: It is important to standardise the process of identification of an individual across healthcare providers. It will be used to uniquely identify persons, authenticate them, and threading their health records (only with the informed consent of the patient) across multiple systems and stakeholders.
- Healthcare Professionals Registry (HPR): It is a comprehensive repository of all healthcare professionals involved in delivery of healthcare services across both modern and traditional systems of medicine. Enrolling in the Healthcare Professionals Registry will enable them to get connected to India's digital health ecosystem.
- Health Facility Registry (HFR): It is a comprehensive repository of health facilities of the country across different systems of medicine. It includes both public and private health facilities including hospitals, clinics, diagnostic laboratories and imaging centres, pharmacies, etc.

- Personal Health Records (PHR): It is an electronic application through which patients can maintain and manage their health information (and that of others for whom they are authorised) in a private, secure, and confidential environment. The citizens can get a longitudinal view of the personal health record by creating and linking the health ID with the visited health care facilities.
- **Aims and Objectives**
- It aims to develop the backbone necessary to support the integrated digital health infrastructure of the country. It will bridge the existing gap amongst different stakeholders of the Healthcare ecosystem through digital highways.
- It aims to create a seamless online platform that will enable interoperability within the digital healthcare ecosystem.
- It aims to give impetus to open and interoperable standards in the digital health ecosystem.
- It aims to significantly improve the efficiency, effectiveness, and transparency of health service delivery overall. Patients will be able to securely store and access their medical records (such as prescriptions, diagnostic reports and discharge summaries), and share them with health care providers to ensure appropriate treatment and follow-up.
- It aims to provide choice to individuals to access both public and private health services, facilitate compliance with laid down guidelines and protocols, and ensure transparency in pricing of services and accountability for the health services being rendered.
- 4. **AMRUT Scheme**
- **CONTEXT: Minister of State for Housing and Urban Affairs, Shri Kaushal Kishore in a written reply to a question in Lok Sabha gave information about AMRUT scheme**
- **About**
- Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched by the Government on June 25, 2015 in 500 selected cities and towns across all States/ Union Territories (UTs).
- AMRUT focuses on development of infrastructure in the sectors of water supply, sewerage management, storm water drainage, non-motorized urban transport, and green spaces and parks.
- A set of Reforms and Capacity Building are also part of the Mission.
- Under AMRUT, project funds have been earmarked for the entire Mission period. Funds have not been earmarked year-wise or city-wise.
- The AMRUT Mission consists of the following major components:
 - ✓ Capacity building
 - ✓ Reform implementation
 - ✓ Water supply and management of sewerage and septage
 - ✓ Drainage of storm water
 - ✓ Improvement in urban transport facilities
 - ✓ Development of green spaces and parks.
- **Objectives**
 - ✓ To ensure a proper supply of water and a sewage connection in every household.
 - ✓ To develop green and well maintained open spaces and parks to increase the amenity value of the cities.
 - ✓ To reduce pollution by switching to public transport or through the construction of non-motorized transport facilities such as walking and cycling.
 - ✓ Atal Mission for Rejuvenation and Urban Transformation (AMRUT) aims in covering around 500 cities that are having a population of over one lakh with notified municipalities.
- AMRUT Mission has been subsumed under AMRUT 2.0, which was launched on 01st October, 2021 and ongoing projects of AMRUT 1.0 will be funded with CA till 31st March, 2023.
- Atal Mission for Rejuvenation and Urban Transformation (AMRUT) 2.0 scheme, which has been launched on 01 October, 2021 for the period of 05 years i.e. from the financial year 2021-22 to the financial year 2025-26, is designed to provide universal coverage of water supply through functional taps to all households in all the statutory towns in the country and coverage of sewerage/septage management in 500 cities covered in first phase of the AMRUT scheme.
- AMRUT 2.0 will promote circular economy of water through development of City Water Balance Plan (CWBP) for each city focusing on recycle/reuse of treated sewage, rejuvenation of water bodies and water conservation.
- It will help cities to identify scope for projects focusing on universal coverage of functional water tap connections, water source conservation, rejuvenation of water bodies and wells, recycle/reuse of treated used water, and rainwater harvesting. Based on the projects identified in CWBP, Mission envisages to make cities 'water secure' through circular economy of water.
- Mission also has a reform agenda on ease of living of citizens through reduction of non-revenue water, recycle of treated used water, rejuvenation of water bodies, augmenting double entry accounting system, urban planning, strengthening urban finance etc.
- Other components of AMRUT 2.0 are:
 - ✓ Pey Jal Survekshan to ascertain equitable distribution of water, reuse of wastewater, mapping of water bodies and promote healthy competition among the cities /towns.
 - ✓ Technology Sub-Mission for water to leverage latest global technologies in the field of water.

- ✓ Information, Education and Communication (IEC) campaign to spread awareness among masses about conservation of water.

The total indicative outlay for AMRUT 2.0 is Rs.2,99,000 crore including Central share of Rs.76,760 crore for five years. This outlay includes funding of Rs.22,000 crore (Rs.10,000 crore as Central Assistance) for ongoing projects of AMRUT till March 2023.

ANSWER WRITING

Q. Discuss the significance of strait of Malacca in international trade.

- The Straits of Malacca is a narrow stretch of water in Southeast Asia that is 550 miles long and is located between the east coast of the Indonesian island of Sumatra and the west coast of the Malay Peninsula.
- It is linked to the Strait of Singapore at its southeast end. The funnel-shaped channel of the Malacca Strait is 800 km long and connects the Indian Ocean to the South China Sea. At its narrowest, Phillips Point, the strait is less than 3km wide.



- The Straits of Malacca are crucial to the flow of global trade and strategically and commercially significant for several reasons.
 - **Strategic Importance:**
 - Shortest sea route between the Middle East and East Asia, helping to reduce the time and cost of transportation among Asia, the Middle East and Europe.
 - Through this corridor, approximately 60% of the world's maritime trade transits, and is the main source of oil supply for two of the main Asian consumers: the People's Republic of China and Japan.
 - The Andaman and Nicobar Command (ANC) was created in 2001 to safeguard India's strategic interests in Southeast Asia and the Strait of Malacca by increasing rapid deployment of military assets in the islands.
 - Economically Viable: It is the shortest sea route between the Indian Ocean and Pacific Ocean and over one-third shorter than the closest alternative sea-based route. It also provides a gateway to energy and food security to India.
 - Diplomatic Importance: Strait of Malacca is lynchpin of India's act east policy.
 - Challenges:
 - ✓ Presence of China: There is constant rise of Chinese Navy in Indian ocean region, and mainly from the strait of Malacca.
 - ✓ Climate change: With the rapid change in climate, there is rise in sea level across various islands.

Conclusion

The realization of the main goals of the Indian foreign policy will depend on several factors. The basics are to complete the expansion of infrastructural facilities on the Archipelago and to quantitatively strengthen units subordinated to Andaman and Nicobar Islands. This will allow India to maintain a greater presence than ever on regional waters and to intensify patrol missions, especially around the key waterways of the Strait of Malacca.

MCQs

- With reference to Space debris, consider the following statements:
 - Space debris includes both natural meteoroid and man-made debris in space.
 - Project NETRA is an initiative by the Indian Space Research Organization (ISRO) to detect debris and hazards to Indian satellites. .
 - The Kessler Syndrome is a phenomenon in which the amount of junk in orbit around Earth reaches a point where it just creates more and more space debris, causing big problems for satellites, astronauts and mission planners.

Which of the statements given above is/are correct?

a) 1 and 2 only b) 2 and 3 only c) 1 and 3 only **d) 1,2 and 3**
- Consider the following statements regarding Nai Roshni and Nai Manzil Schemes:
 - The schemes are implemented by the Ministry of Women and Child Development.
 - The Nai Roshni Scheme aims to empower and enhance confidence in women belonging to Sikh, Buddhist, Jain, Muslim, Christians and Parsi community only.

3. The Nai Manzil Scheme aims to benefit only women of 17-35 years of age from the six notified minority communities.
Which of the above statement/s is/are incorrect?
a) 1 and 2 only b) 2 and 3 only c) **1 and 3 only** d) 1, 2 and 3
3. Consider the following statements regarding Atal Bhujal Yojana:
1. It is an IMF-funded, central sector scheme that aims at improving groundwater management.
2. The scheme is being implemented throughout India.
3. The Ministry of Environment, Forest and Climate Change is the nodal implementing agency of the scheme.
Which of the above statement/s is/are not correct?
a) 1 and 2 only b) 1 and 3 only c) 2 and 3 only d) **1, 2 and 3**
4. With reference to Ayushman Bharat Digital Mission, consider the following statements:
1. Private and public hospitals must adopt it.
2. As it aims to achieve universal health coverage, every citizen of India should be part of it ultimately.
3. It has seamless portability across the country.
Which of the statements given above is/are correct?
a) 1 and 2 only b) **3 only** c) 1 and 3 only d) 1,2 and 3
5. The Thrust Areas of Atal Mission for Rejuvenation and Urban Transformation (AMRUT) include
1. Water supply
2. Sewerage facilities
3. Public Transport facilities
4. Creation of parks and recreation centres especially for children.
5. Storm water drain to reduce flooding
Select the correct answer from the given codes
a) 1,2,3 and 4 only b) 1,3,4 and 5 only c) 2,3 and 5 only d) **1,2,3,4 and 5**
6. Consider the following schemes recently seen in news
1. A Scheme for Promoting Innovation, Rural Industry & Entrepreneurship (ASPIRE)
2. Coir Vikas Yojana (CVY)
3. Prime Minister Employment Generation Programme
4. Micro & Small Enterprises Cluster Development Programme (MSE-CDP)
5. Credit Linked Capital Subsidy Scheme (CLCSS)
6. Revamped Scheme of Fund for Regeneration Of Traditional Industries (SFURTI)
Which of the following schemes fall under the Ministry Of Micro, Small and Medium Enterprises (MSMEs)?
a) 1,2,3 and 4 only
b) 2,3,4, and 5 only
c) 3,4,5 and 6 only
d) **All of the above**
7. Indian Government Bond Yields are influenced by which of the following?
1. Actions of the United States Federal Reserve
2. Actions of the Reserve Bank of India
3. Inflation and short-term interest rates
Select the correct answer using the code given below.
a) 1 and 2 only b) 2 only c) 3 only d) **1, 2 and 3**
8. The Unique Identification Authority of India (UIDAI) Headquarter in New Delhi has won the prestigious GRIHA Exemplary Performance Award 2022, with reference to this news consider the following
1. Are green building rating systems
2. Issue energy compliance certificate
3. Refer to Global standards
4. Are Indian standards under finalization
The LEED and GRIHA are associated with which of the above?
a) **1 and 2 only** b) 2 and 3 only c) 3 and 4 only d) 2 and 4 only
9. With reference to Petroleum and Explosive Safety Organisation (PESO) consider the following
1. Petroleum and Explosives Safety Organization (PESO) is an organization which is under the Department of industrial policy and promotion (DIPP), Ministry of commerce and industry.
2. It administers the usage of explosives & petrol stations in India.
Which of the above statement/s is/are correct?
a) 1 only b) 2 only c) **Both 1 and 2** d) Neither 1 nor 2
10. Which of the following ministry decided to organise a one of its kind musical event, "Dance to Decarbonise"?
a) Ministry of Environment, forest and climate change
b) Ministry of Culture
c) Ministry of Road Transport and Highway
d) **Ministry of Petroleum and Natural Gas**