INDIAN NATIONAL SCIENCE ACADEMY (INSA)

- The INSA was established in 1935 with the object of promoting science in India and harnessing scientific knowledge for the cause of humanity and national welfare.
- The foundation of the Academy, earlier known as the National Institute of Sciences of India (NISI), was the outcome of joint endeavours of several organizations and individuals, and the Indian Science Congress Association (ISCA) playing a leading role in this regard.
- It was inaugurated at Calcutta and functioned with its headquarters at Asiatic Society of Bengal till 1951 and thereafter shifted to Delhi.

Objectives:

- Promotion of scientific knowledge in India, including its practical application to problems of national welfare.
- Coordination among Scientific Academies, Societies, Institutions, Government Scientific Departments, and Services.
- To act as a body of scientists of eminence for the promotion and safeguarding of the interests of scientists in India and to present internationally the scientific work done in the country.
- To act through properly constituted National Committees, in which other learned academies and societies may be associated, for undertaking scientific work of national and international importance which the Academy may be called upon to perform by the public and by the Government.
- To publish such proceedings, journals, memoirs, and other publications as may be found desirable.
- To promote and maintain liaison between Science and Humanities.

WHAT IS BLOOD MONEY?

- Blood money', or 'diya', finds footing in the Islamic Sharia law and is followed in countries that incorporate these laws in their legislation.
- Under the rule of 'diya', a select quantity of a valuable asset, primarily monetary, has to be paid by the perpetrator of the crime to the victim or the victim's family if the latter has died.
- The custom is practised predominantly in cases involving unintentional murder and culpable homicide.
- It is also invoked in murder cases wherein the victim's kin choose not to retaliate through 'qisas' (a way of retribution under the Sharia).
- The end-goal, as the law says, is not to put a price tag on human life but to alleviate the plight and suffering of the affected family and their potential loss of income.
- However, it is to be noted that even if the concerned parties reconcile through 'blood money', the community and the state will retain the right to impose a deterrent punishment, including penalties.
- In its contemporary applications, 'blood money' is upheld in several Islamic countries with factors such as gender, religion, and nationality of the victim coming into play.
- In Saudi Arabia, for instance, the traffic regulations specifically mandate payment of 'blood money' to heirs of the victims who die in road accidents. In addition, the perpetrator shall be liable to a prison term.

What's India's stand on 'diya'?

- Provisions for the grant or receiving of 'blood money' do not find a place in India's formal legal system.
- However, the system does provide a way for the accused to negotiate with the prosecution through 'plea bargaining'.

ATOMIC ENERGY COMMISSION (AEC)

- It is the governing body of the Department of Atomic Energy (DAE), Government of India.
- The Department of Atomic Energy (DAE) was set up on August 3, 1954, under the direct charge of the Prime Minister through a Presidential Order.
- As per this order, all businesses of the Government of India related to atomic energy and to the functions of the Central Government under the Atomic Energy Act, 1948, were directed to be transacted in the DAE.
- Subsequently, in accordance with a government resolution dated March 1, 1958, the Atomic Energy Commission (AEC) was established in the DAE.
- The AEC is responsible for formulating the policy of the DAE.
- The secretary to the government of India in the DAE is ex-officio chairman of the AEC.
- The other members of the AEC are appointed for each calendar year on the recommendation of the AEC chairman and after approval by the Prime Minister.
- Headquarters: Mumbai, Maharashtra

About Department of Atomic Energy (DAE):

- DAE encompasses all the areas related to power and non-power applications of atomic energy.
- It has the mandate of development of nuclear power technology which includes exploration, identification and processing of uranium resources and atomic minerals, fabrication of nuclear fuel, production of heavy water, construction and operation of nuclear power plants, nuclear fuel reprocessing and waste management.
- It is also responsible for research and development of fast reactors and fusion technologies, accelerator and laser technology, advanced electronics and instrumentation, materials science, biological sciences, etc.

CENTRAL SUSPECT REGISTRY

- It is an initiative to strengthen cyberfraud risk management by creating a registry of identifiers.
- It was created based on the National Cybercrime Reporting Portal (NCRP).
- It contains data of 1.4 million cybercriminals linked to financial fraud and various cyber-crimes.
- It has been developed by the Indian Cyber Crime Coordination Centre (I4C), and can be accessed by states and UTs as well as central investigation and intelligence agencies.
- The registry was developed with collaboration from the banks/financial institutions and using it as a central-level database with consolidated data on cybercrime suspects.

What is Indian Cyber Crime Coordination Centre (I4C)?

- It has been established under the Ministry of Home Affairs (MHA) to deal with cybercrime in the country in a coordinated and comprehensive manner.
- It 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:
- It acts as a nodal point in the fight against cybercrime.
- It identifies 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.
- It prevents misuse of cyberspace for furthering the cause of extremist and terrorist groups.

ELECTROKINETIC MINING

- It is a novel mining technique which uses Electrokinetic i.e the application of a direct or alternating electric field to accelerate the migration of movable species, such as metals, water, and particles.

Issue with present technique:

- Currently, heavy rare earth elements (HREE) are dominantly mined from ion-adsorption rare earth deposits (IADs) discovered in South China, and the regional mining produces and supports 95% of the global demand of HREEs.
- However, the conventional mining applies excessive usage of ammonium-salt-based leaching agents to recover HREEs from IADs, such technique exhibits low efficiency and devastating environmental impact on the local eco-system.

Advantages of Electrokinetic Mining:

- It reduces leaching agent usage by 80%, and energy consumption by 60%.
- High recovery rate: Its recovery rate exceeds 95% which marks a breakthrough in sustainable mining.
- It can simultaneously help reduce the environmental impacts and improve the recovery rate of REEs.

FAST TRACK IMMIGRATION – TRUSTED TRAVELLER PROGRAM

- It is an initiative to speed up the Immigration clearance process for eligible persons from the following categories: Indian Nationals and Foreign Nationals holding OCI Cards.
- It was first launched at Delhi's IGI Airport in 2024.

Purpose: It has been introduced with the purpose of facilitating international mobility with faster, smoother and secure immigration clearances.

- To enroll in the scheme, the applicant has to register online on the portal with details and documents.
- One can sign up after successfully authenticating their identity through mobile OTP and email verification. One needs to ensure that the Passport is valid for at least 6 months at the time of applying for FTI-TTP.
- Applicants found eligible, will need to provide Biometrics (fingerprint and face image) in addition to the required information as per the data fields provided in the application form.
- Biometrics of the registered applicants will be captured at the Foreigners Regional Registration Office (FRRO) or at the time of passage through the airport. The registered passenger has to scan the boarding pass issued by the airlines at the e-gates and then scan the passport.
- The FTI registration will be valid for a maximum of five years or until the validity of the passport, whichever comes first.
- It will be implemented at 21 major airports across the country. In the first phase, in addition to Delhi, this facility is being introduced at seven major airports—Mumbai, Chennai, Kolkata, Bengaluru, Hyderabad, Kochi, and Ahmedabad.

Nodal Agency: The FTI-TTP is implemented through an online portal with the Bureau of Immigration being the nodal agency.

Significance: Once Indian and foreign citizens with OCI cards enroll and become members of the Fast Track Immigration -Trusted Traveller Programme, their immigration clearance will be faster, easier, and more secure.

GROWING PLANTS IN SPACE: THE FUTURE OF SUSTENANCE BEYOND EARTH

Why Grow Plants in Space?

- As space missions extend over years, traditional food supplies fall short due to their limited shelf life and nutritional degradation over time.
- Growing plants in space addresses these challenges by:
    - **Sustaining Food Supply**: Plants provide a renewable source of nutrition.
    - **Oxygen Production**: Photosynthesis in plants releases oxygen, making the air aboard spacecraft breathable.
    - **Recycling Systems**: Plants create a closed-loop system by recycling carbon dioxide and organic waste.
    - **Mental Health Benefits**: Tending to plants helps reduce stress and enhances astronauts' overall well-being.

Challenges of Growing Plants in Space:

- Growing plants in space presents several obstacles, primarily due to the microgravity environment:
    - **Root Growth and Water Delivery**:
        - In microgravity, roots lack the directional pull of gravity and fail to grow downward.
        - Water clings to surfaces rather than reaching the roots, complicating nutrient absorption.
    - **Radiation and Temperature Fluctuations**:
        - High levels of radiation can damage plant DNA and hinder growth.
        - Extreme temperature variations in space require insulation to protect plants.
    - **Light Limitations**:
        - In regions of low sunlight, photosynthesis is disrupted, reducing oxygen production.

Techniques for Space Farming:

- Scientists have developed innovative methods to grow plants in space:
    - **Hydroponics**: Uses liquid solutions to deliver water and nutrients directly to plants, eliminating the need for soil.
    - **Aeroponics**: Plants grow with their roots suspended in air, using mist for nutrient delivery. This method reduces water and fertiliser usage while eliminating the need for pesticides.
    - **Soil-like Media**: Mimics terrestrial soil to support plant growth, often supplemented with slow-release fertilisers.
- The **'Veggie' system** aboard the International Space Station (ISS), a space garden about the size of a carry-on bag, exemplifies these approaches.

Significance of Space Farming:

- Cultivating plants in space is a cornerstone of future interplanetary missions.
- By providing fresh food, recycling resources, and enhancing mental health, space-grown crops contribute to the sustainability of long-term extra-terrestrial habitats.
- Advances like ISRO's CROPS experiment underscore India's growing expertise in this critical field.

Conclusion:

- The successful growth of lobia seeds in ISRO's space module is a step forward in addressing the challenges of space farming.
- As humans prepare for extended missions and the colonisation of other planets, innovations in space agriculture will play a pivotal role in ensuring sustainability and self-sufficiency beyond Earth.

INS SURAT, INS NILGIRI AND INS VAGHSHEER COMMISSIONED

Commissioning Ceremony of Three Vessels

- Prime Minister Narendra Modi presided over the commissioning of INS Nilgiri, INS Surat, and INS Vaghsheer, marking the first time a destroyer, a frigate, and a submarine have been commissioned together in the Indian Navy.

- **Significance of the Vessels**
  - **Indigenous Construction**: All three vessels are Made in India, underscoring India's growing self-reliance in defense capabilities.
  - **Development Timeline**: The journey from design to commissioning of these ships spanned 10 to 15 years, reflecting the long-term investment in naval infrastructure.
- **Strategic Importance**
  - **Enhancing Naval Power**: The addition of these platforms strengthens India's defense capabilities, contributing to the Navy's force level needed to deter regional threats.
  - **Bolstering Maritime Influence**: These ships are key to enhancing India's strategic maritime presence in the Indian Ocean Region and beyond.
- **Dual Military and Economic Significance**
  - The commissioning of these vessels holds both military and economic importance, strengthening India's defense posture and reinforcing its role as a key player in global maritime security.