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Chemical Weapons Convention (CWC)

***Prelims**: Current events of National and International Importance| International organisations*

Why in news?

Recently, Organisation for the Prohibition of Chemical Weapons held Asia Meeting in New Delhi in 2025.

- **Entered into force** - 1997
- **Objectives** - To *eliminate an entire category of weapons of mass destruction* by prohibiting the development, production, acquisition, stockpiling, retention, transfer or use of chemical weapons by States Parties.
- **Membership** – 193 nations.
- **India's membership** – India is an original signatory.
- **Role of signatories** – States Parties must take the steps necessary to enforce that prohibition in respect of persons (natural or legal) within their jurisdiction.
- **Implemented by** - Organisation for the Prohibition of Chemical Weapons (OPCW).

Organisation for the Prohibition of Chemical Weapons
• **Formed in** – 1997 • **Headquarters** – The Hague, Netherlands • **Objectives** – To *implement the Chemical Weapons Convention* (CWC) and to oversee the global endeavour to *permanently and verifiably eliminate chemical weapons*. • **Activities** – It *organises regional meetings of National Authorities annually* to support implementation of the Convention through capacity building of National Authorities. • This interaction fosters bilateral and regional cooperation and bolster networks among National Authorities. • **Recognition –** It was awarded the *2013 Nobel Peace Prize*.

Role of India in Elimination Chemical Weapons

- **National Authority Chemical Weapons Convention (NACWC)** – It is the national authority responsible for *implementing the Chemical Weapons Convention (CWC) in India*.
- **Indian Chemical Council (ICC)** -It is India's oldest Chemical Industry Association works closely with the NACWC for reaching out to industry.
- **Recognition to India's efforts** – *ICC received the OPWC- The Hague award in 2024,* as a co-recipient, for its role in promoting chemical safety, compliance with the Convention, and enhancing industry-wide security practices in India.
- This is the 1st time globally, that a chemical industry body was honoured with this

award.

> *The '**OPCW-The Hague Award**' recognizes individuals and organizations that play a significant role in advancing the goals of the Chemical Weapons Convention.*

Reference

PIB| Regional Meeting of OPCW in India

Research Development and Innovation (RDI) Scheme

***Prelims**: Current events of national and international importance*

Why in news?

Recently, the Union Cabinet has approved the Research Development and Innovation (RDI) Scheme.

- **Nodal department** - Department of Science and Technology (DST) under Ministry of Science and Technology.
- **Objectives** – To provide *long-term financing or refinancing* with long tenors at low or nil interest rates to spur private sector investment in RDI.
- To finance transformative projects at higher levels of Technology Readiness Levels (TRL) and to support acquisition of technologies which are critical or of high strategic importance.
- To facilitate setting up of a *Deep-Tech Fund of Funds*.
- To provide growth & risk *capital to sunrise and strategic sectors*.
- **Strategic guidance by** – The Governing Board of Anusandhan National Research Foundation (ANRF).

> ***Anusandhan National Research Foundation (ANRF),** established in 2023 is an apex body to provide "high-level strategic direction" to scientific research in India. It function under Department of Science and Technology (DST) and is chaired by Prime Minister. It replaced the Science and Engineering Research Board (SERB).*

- **Administration** – The *Executive Council (EC) of ANRF* will approve the Scheme's guidelines, and recommend 2nd level fund managers and scope and type of projects in sunrise sectors.
- An Empowered Group of Secretaries (EGoS) led by the Cabinet Secretary, will be responsible for approving scheme changes, sectors and types of projects as well as second-level fund managers besides reviewing the performance of the Scheme.
- **Financial outlay** - Rs. ***One lakh Crore***.
- **Funding mechanism** – It is done under *2-tier funding mechanism*

- At the first level, a *Special Purpose Fund (SPF)* established within the ANRF, which will act as the custodian of funds.
- From the SPF, funds shall be allocated to a variety of 2nd level fund managers, mainly in the form of long-term concessional loans.
- The funding to R&D projects by the 2nd level fund managers would normally be in the form of long-term loan at low or nil interest rates.
- Financing *in the form of equity* may also be done, especially in case of startups.

Reference

PIB| Research Development and Innovation (RDI) Scheme

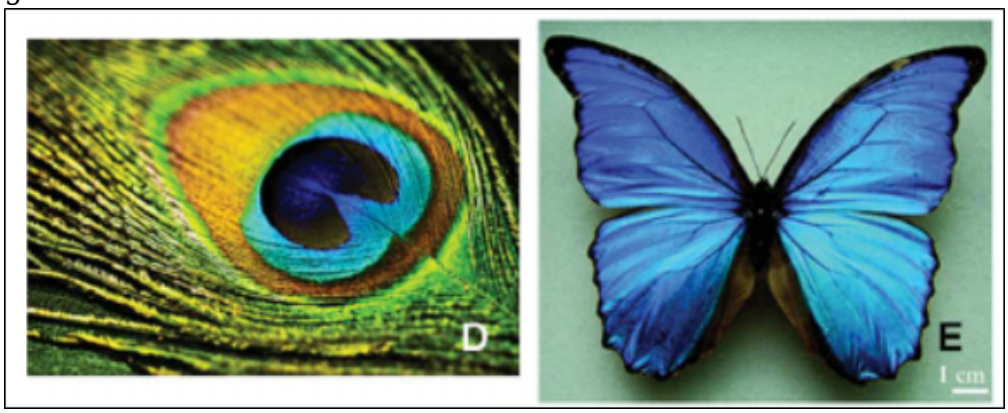
Structural Coloration

Prelims: *Science and technology | Current events of national and international importance*

Why in news?

Recently, scientists at the Centre for Nano and Soft Matter Sciences (CeNS) have now found a way to harness a property known as structural coloration.

> ***Centre for Nano and Soft Matter Sciences (CeNS),*** *an autonomous institute of Department of Science and Technology (DST) under Ministry of Science and Technology is located in Bengaluru.*

- **Structural coloration** – It refers to colors in materials that is caused a result of the physical structure of the material.
  - **Example**: The *colour of the peacock's feathers* & radiant *wings of a butterfly* change depending on how you look at it, varying between shimmering blues and greens.
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- **Research work** – It explores how size-reduced monolayers of self-assembled polystyrene (PS) nanospheres exhibit angle-dependent optical properties due to collective light-matter interactions within the monolayer.

Structural colors arising from nanoscale geometry can be finely tuned by varying both the size of colloidal spheres and the angle of light incidence.

- **Polystyrene Nano spheres** - These are about 400 nanometers wide which *naturally arrange themselves* into a flat, hexagonal pattern when floated on water.
- This self-assembly, driven by simple surface forces, results in what the scientists call a ***close-packed monolayer***.
- **Reactive ion etching** — It is a kind of *nano-scale sandblasting*, to gently shrink the spheres without disturbing their neat arrangement once a monolayerr is formed.
- This size reduction leads to a "non-close-packed" layout.
- **Property of light** – It behaves differently as it hits the altered surface.
- When light reflects off this nanostructured layer, its interaction with the tiny spheres causes *certain wavelengths (colors) to be amplified or diminished.*
    - **For instance**, by tilting the surface or changing the viewing angle, the reflected color shifts—typically towards blue.
- This phenomenon is predictable and tunable due to the way in which the spacing and size of the spheres affect light's path.
- **Advantages** – They do not rely on harmful dyes or complex fabrication processes and are durable and vibrant.
- **Applications** – It is used to *create tunable color-shifting materials* using tiny plastic beads that can be used for
    - Wearable sensors, anti-counterfeit tags, display technologies and even eco-friendly paints.

Reference

PIB| Tuning Structural Coloration in Laboratory

Equine Disease-Free Compartment (EDFC)

***Prelims**: Current events of National and International Importance*

Why in the news?

Recently, India established its 1st internationally recognized Equine Disease-Free Compartment (EDFC) at RVC Centre, Meerut.

- **EDFC** – It is a ***scientifically managed and biosecure zone***, where horses are kept free from specific equine diseases.

*The term '**Equine'** comes from 'equus' a latin word, means horse. Equine diseases are health illnesses caused primarily to horses, mules, monkeys etc.*

- **Coordination by**
  - Ministry of Fisheries, Animal Husbandry and Dairying
  - Directorate of Remount Veterinary Services, Ministry of Defence
  - Equestrian Federation of India (EFI)
  - Animal Husbandry Department, Government of Uttar Pradesh.
- **Recognized by** - *World Organization for Animal Health (WOAH)*, as it followed the standards outlined in the WOAH Terrestrial Animal Health Code.

> ***World Organization for Animal Health (WOAH)*** *was founded in 1924 as an intergovernmental organization. It focusses on transparently disseminating information on animal diseases, improving animal health globally and thus build a safer, healthier and more sustainable world.*

- The centre has been officially declared free from Equine Infectious Anemia, Equine Influenza, Equine Piroplasmosis, Glanders, and Surra.

> *India has historically remained free from African Horse Sickness since 2014.*

- **Compartmentalization** - Segregates a defined sub-population of horses to maintain disease-free status.
- **24×7 Surveillance** - Continuous veterinary checks and real-time monitoring of equine health.
- **Biosecurity Measures** - Standard Operating Procedures for pest control, hygiene, waste disposal, and animal health monitoring.
- **Functions** – It supports the broader *development of horse-related activities* in the country.
  - **For example:** Sports, breeding, and high-value equine trade.
- It helps in strengthening India's biosecurity and disease preparedness framework.
- **Importance** – Indian sport horses from this facility can now be *eligible to travel and compete abroad*.
- It enables the international movement of Indian sport horses in *compliance with global biosecurity* and animal health standards.
- It enhances India's compartmentalization approach to the poultry sector, with *Highly Pathogenic Avian Influenza (HPAI) Free Compartments* to enable the safe export of poultry products.

Reference

PIB| Establishment of Equine Disease-Free Compartment

Quality Control Orders

Prelims: *Economic Development | Current events of National and International Importance*

Why in news?

During 75th anniversary celebration of SGS in India, the Union Minister of Commerce and Industry had announced that the number of Quality Control Orders has grown from 14 to 156 covering 672 products.

> ***Société Générale de Surveillance (SGS)*** *is the world's leading Testing, Inspection and Certification company that operate across 115 countries including India.* ***SGS India*** *is a subsidiary of this multinational company which is contributing since 1951.*

- **QCOs** – They are regulatory measures to establish quality standards for specific products or product categories.
- **Need** – For protection of human, animal or plant health, safety of environment, prevention of unfair trade practices and national security.
- **Objectives** – To ensure that products meet certain prescribed quality, safety, and performance requirements before they can be manufactured, imported, stored, or sold in the country.
- To establish a *unified quality standard* for domestic and global markets.
- **Issued by** – Various *Line Ministries (Regulators)* under the Central Government.
- **Prohibition orders** - After passage of QCO, no person shall manufacture, import, distribute, sell, hire, lease, store or exhibit for sale any product(s) covered under the QCO without a Standard Mark except under a valid Licence from BIS.

> ***Bureau of Indian Standards (BIS) of 1986****, the National Standards Body of India is engaged in the activities of Standardization, Conformity Assessment and Quality Assurance of goods, articles, processes, systems and services. The Indian Standards established by BIS forms the basis for the Product Certification Schemes, which provides Third Party Assurance of Quality, Safety and Reliability of products to consumers.*

- **Role of BIS in implementation of QCOs** – It acts as the *Certification Authority and grants Licence* to manufacturers as per relevant Conformity Assessment Scheme.
- It also acts as the *Enforcement Authority* for the products specified in the QCO.
- It provides technical inputs related to Indian Standards, appropriate Conformity Assessment Scheme etc.
- It also participates in stakeholder's consultation meeting.

References

1. PIB| Increased Quality Control Orders in India
2. BIS| Quality Control Orders



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