

**INTERNATIONAL RELATIONS [GS-II]****SCO Defence Ministers' Meeting in Kazakhstan**

The Shanghai Cooperation Organisation (SCO) Defence Ministers' meeting took place in Astana, Kazakhstan.

- **Agreements and Declarations:** During the meeting, a protocol was signed by the Defence Ministers of all SCO Member States.
- A Joint Communiqué was issued after the meeting, in which the SCO Defence Ministers agreed to develop the idea of 'One Earth, One Family, One Future', which is rooted in the ancient Indian philosophy of 'Vasudhaiva Kutumbakam'.
- **India's Commitment to Peace and Counterterrorism:** The Defence Secretary of India reiterated India's commitment towards maintaining peace, stability and security in the SCO region.
- He emphasized the need to adopt a zero-tolerance approach towards terrorism in all its forms for prosperity and development of the SCO Member States.
- He mentioned India's long-standing proposal of Comprehensive Convention on International Terrorism at the United Nations.

**Shanghai Cooperation Organization (SCO):**

- **About:** The SCO is an eight-member multilateral organization, established on 15 June 2001 in Shanghai, China by the leaders of China, Kazakhstan, Kyrgyzstan, Russia, Tajikistan and Uzbekistan.
- **Origin:** Prior to the creation of SCO in 2001, Kazakhstan, China, Kyrgyzstan, Russia and Tajikistan were members of the Shanghai Five.
- **Shanghai Five (1996)** emerged from a series of border demarcation and demilitarization talks which the four former Soviet republics held with China to ensure stability along the borders.
- Following the accession of Uzbekistan to the organization in 2001, the Shanghai Five was renamed the SCO.
- **Official Languages:** Russian and Chinese
- **Member states:** Kazakhstan, China, Kyrgyzstan, Russia, Tajikistan, Uzbekistan, India, Pakistan and Iran.
- **Observer States:** Afghanistan, Belarus, Mongolia
- **Coverage:** The SCO's geographic scope covers 60 percent of Eurasia and represents 40 percent of the world's population, with a combined GDP accounting for 20 percent of the global economy.
- **Chairmanship:** The Chairmanship of SCO is by rotation for a year by Member States.

**Objectives:**

- To strengthen mutual trust, friendly relations and cooperation among young people of SCO member States.
- It seeks to counter western influence in Eurasia.

**India and SCO:**

- India was granted Observer status at the July 2005 Astana Summit, and subsequently participated in all SCO forums open to Observers.
- India and Pakistan became members at the Astana Summit, in 2017.

**Organizational Structure:**

- **Heads of State Council:** The supreme SCO body which decides its internal functioning and its interaction with other States & international organizations, and considers international issues.
- **Heads of Government Council:** Approves the budget, considers and decides upon issues related to economic spheres of interaction within SCO.
- **Council of Ministers of Foreign Affairs:** Considers issues related to day-to-day activities.
- **Regional Anti-Terrorist Structure (RATS):** Established to combat terrorism, separatism and extremism.
- **Secretariat:** The Secretariat of the SCO serves to implement organizational decisions and decrees, documents (such as declarations and agendas).

**INDIAN ECONOMY [GS-III]****IREDA gets Navratna Status**

- Recently, Indian Renewable Energy Development Agency (IREDA) was granted 'Navratna' status by the Department of Public Enterprises.
- Comparing year-on-year figures, IREDA witnessed a 32% rise in net profit, while it remained consistent quarter-on-quarter at ₹337 crore.

**About Navratna Status:****Criteria for Classification:**

- To qualify for Navratna status, a company must first attain the Miniratna category-I designation and be included in Schedule A of Central Public Sector Enterprises (CPSEs).
- For a company to achieve Navratna status, it must report a net profit of more than Rs 5,000 crore for three consecutive years, and maintain an average annual turnover of Rs 25,000 crore for three years, or have an annual average net worth of over Rs 15,000 crore for three years.
- CPSEs must have achieved an 'excellent' or 'very good' rating in the Memorandum of Understanding (MOU) for three out of the last five years.
- Also, eligible CPSEs must attain a composite score of 60 or above in six selected performance indicators (see image).

**Benefits Avail:**

- The Indian government granted Navratna status to premier public sector undertakings (PSUs), empowering them to execute significant investments of up to ₹1,000 crore without requiring approval from the central authority.
- These firms are permitted to allocate up to 30% of their net worth annually, provided it remains under ₹1,000 crore.
- They have the option to participate in joint ventures, forge partnerships, and set up overseas subsidiaries.
- The status gives the Board of Directors of these CPSEs the power to allow mergers and acquisitions in India and abroad.
- However, they need approval from the Cabinet Committee on Economic Affairs (CCEA) to make investments abroad.

**About Indian Renewable Energy Development Agency (IREDA):**

- Under the Aegis of: IREDA is a non-banking financial institution under the Ministry of New and Renewable Energy, established in 1987.
- Evolution:
  - 1987: It was established and later to be classified under the "Public Financial Institution" under section 4 'A' of the Companies Act, 1956, and is officially registered as a Non-Banking Financial Company (NBFC) with the Reserve Bank of India (RBI).
  - 2015: The Ministry of New and Renewable Energy (MNRE) acknowledged IREDA's contributions by conferring upon it the status of Mini Ratna (Category-I).
  - 2023: The MNRE, has upgraded IREDA from Schedule B to Schedule A category Central Public Sector Enterprises. This paved the way for IREDA to attain Navratna status, granting it greater financial autonomy.
  - 2024: The Department of Public Enterprises granted 'Navratna' status to IREDA.
- Mandate: IREDA is engaged in promoting, developing and extending financial assistance for setting up projects related to new and renewable sources of energy.
- It offers financial assistance to projects that produce electricity using fresh and sustainable sources. The government holds a 75% ownership stake in the company.
- Some Remarkable Projects of IREDA:
  - Green Rooftops Scheme, World's First Floating Solar PV Project, Financing Battery Energy Storage Systems (BESS)

**ENVIRONMENT[GS-III]****Declining Trend in Solar Power Potential in India: IMD study**

Recently, A study published in the Journal 'Mausam' by India Meteorological Department has revealed a significantly decreasing trend in solar power generation potential in the country and has suggested use of more efficient equipment to deal with the situation.

**Key Finding in the Study :**

- The study titled "Understanding the climatology and long-term trends in solar radiation using ground based in-situ observations in India," published by IMD.

**Solar radiation :**

It has an important role in governing the earth's surface-atmosphere energy exchange and climate of the Earth.

It modulates global energy balance and changes the climate and hydrological cycle.

Various sectors such as agriculture, energy, industry, etc. directly or indirectly depend on the incoming solar radiation.

Direct irradiance is the part of the solar irradiance that directly reaches a surface;

Diffuse irradiance is the part that is scattered by the atmosphere;

Global irradiance is the sum of both diffuse and direct components reaching the same surface.

Irradiance is the power of solar radiation per unit area, measured in W/m<sup>2</sup>

- The quantity of solar radiation available that can be economically converted by solar panels to electricity is showing an "alarming decreasing trend" in several locations in India.
- Solar power potential in India has decreased over the last three decades.

**Decreasing Solar Radiation Due to :**

- Increased aerosol load.
  - Causative factors behind increased aerosol load : fine particles from carbon emissions, fossil fuel burning and dust and clouding.
  - Aerosols absorb the sunlight and deflect it away from the ground and they can also precipitate the formation of dense clouds that again block sunlight.
- The efficiency of solar panels are significantly influenced by the amount of sunlight incident on them.

**Solar energy :**

It has been recognized as an alternative to conventional energy resources.

Amongst all the clean technologies, solar energy serves as an effective renewable energy resource to mitigate greenhouse gas emissions and reduce global warming.

It is one of the resources capable of self-reliant energy generation, reducing foreign energy dependence.

**Solar Energy In india :**

India is 5th in Solar Power capacity (as per International Renewable Energy Agency – Renewable capacity statistics 2023)

As of today, India's installed solar power capacity is about 81 GW (1 GW is 1,000 megawatt), or roughly 17% of the total installed electricity.

India has ambitious plans of sourcing about 500 GW, nearly half its requirement of electricity, from non-fossil fuel sources by 2030.

At least 280 GW from solar power by that year or at least 40 GW of solar capacity being annually added until 2030.

Incident Solar Energy in India : The energy of about 5,000 trillion kWh per year is incident over India's land area with most parts receiving 4 to 7 kWh m<sup>-2</sup> per day.

- Therefore it highlighted the need for installing more efficient solar panels & need for wide use of solar panels with better efficiency to meet the energy requirements from solar resources.
- Study based on the climatology and global radiation (GR) trends, diffuse radiation (DR), bright sunshine hours (BHS), and technical potential of solar power (solar photovoltaic potential/SPV) using in-situ data procured from the IMD between 1985 and 2019.
- Global radiation (GR) trends :
  - Maximum over north-west India and inland areas of peninsular India.
  - Minimum over the extreme north and north-east India.
  - Reduction in GR is due to : Increased atmospheric turbidity and cloudiness.

- However, The declining trend of the average GR over the country has been reduced in the recent decade.
- Diffuse Radiation (DR) :
  - DR is high over coastal stations, including the extreme northern parts of the country.
  - A significant increase in DR has been observed in more than 50 percent of the stations, especially in the northwest and some parts of peninsular India,
  - Reduction in DR is due to : increased atmospheric turbidity and cloudiness.
  - The rate of increase of average DR over the country has escalated in the recent decade.
- Bright Sunshine Hours (BHS) :
  - Annual BHS is high in northwest India & Low in north, north-east and southern peninsular India.
  - BHS has significantly decreased in 75 percent of the selected stations,
  - Most of the stations exhibit maximum BHS during the pre-monsoon and minimum during the monsoon season.
- Technical Potential of Solar Power (Solar photovoltaic Potential) : SPV is the amount of radiation that may be practically available to be converted to electricity by panels.
  - The country has vast SPV potential, in the range of 1800–3400 Wm<sup>-2</sup>, though with substantial regional variations.
  - Data from in house stations to compute the changes in solar photovoltaic (SPV) potential showed a general decline in all stations.
  - India's largest solar parks are located in the north-west, particularly Gujarat and Rajasthan, and cities in both these States are also showing a decrease in SPV potential.

Therefore, Study Highlighted that Understanding the variations of solar power potential over the country is essential for the optimum utilization of solar energy in power generation, which demands accurate information of solar radiation and its variations.

### PRELIM FACT

#### 1. Antihistamines

There has been an increase in the intake of antihistamines to treat health concerns.

1. About Antihistamines: They are common drugs that can be purchased without a prescription. They are used to treat short-lived allergic reactions, like a sneezing fit or an itch.
2. How it functions: An antihistamine drug functions by targeting histamine receptors, which are proteins that bind to a compound called histamine in the body.
3. Its Composition: This compound is composed of ethylamine and imidazole, with the latter forming a ring structure.
4. Functions of Histamine: Histamine performs various roles in the body through four types of receptors: H1, H2, H3, and H4.
  - a) The H1 receptor is predominantly found in blood vessels, neurons, and smooth muscle cells, and its blockade helps alleviate minor allergies.
  - b) H2 receptors are present in gastric gland cells. They stimulate the release of gastric acid for digestion.
  - c) H3 receptors are located in the central nervous system. This regulates the release of neurotransmitters, including dopamine and serotonin.
  - d) H4 receptors control the body's inflammatory response, including allergic reactions.
5. Research is currently focused on H3 and H4 receptors to develop specialized drugs for treating neurological and immunological disorders.

#### 2. Nephrotic Syndrome

Researchers from Kerala have reported a series of cases from Malappuram district where the regular use of fairness creams has been linked to nephrotic syndrome.

1. About Nephrotic syndrome: It is a kidney disorder characterized by excessive protein loss in urine due to issues with the kidneys' filtration system, specifically the glomeruli.
2. Function of glomeruli: In healthy kidneys, glomeruli filter waste and excess fluids while retaining essential cells and proteins.

3. What happens in nephrotic syndrome: In nephrotic syndrome, inflamed glomeruli allow too much protein leakage. This condition can result from various kidney diseases or systemic disorders like diabetes or lupus.
4. Symptoms: Symptoms include severe swelling, foamy urine, high blood fat levels, weight gain, fatigue, and loss of appetite.
1. Complications may include blood clots, increased infection risk, high blood pressure, and potential kidney issues, such as chronic kidney disease or kidney failure.
5. Treatment: Treatment involves managing the underlying cause and addressing related concerns, including blood pressure control, cholesterol reduction, swelling mitigation, and infection prevention through medication and dietary adjustments.

### **3.Phi-3-mini**

Recently, Microsoft unveiled the latest version of its 'lightweight' AI model that is the Phi-3-Mini.

1. About Phi-3-mini: It is the smallest AI model developed by Microsoft. It is believed to be the first in a series of three smaller models planned by Microsoft.
2. Features:
  - a) It performed well in various benchmarks, such as language, reasoning, coding, and mathematics, outperforming other models of similar and larger sizes.
  - b) It has the ability to support a context window of up to 128K tokens. This allows it to handle extensive conversation data with minimal impact on quality.
  - c) It is a 3.8B language model. It is accessible on platforms like Microsoft Azure AI Studio, Hugging Face, and Ollama.
  - d) It comes in two variants: one with a 4K content-length and another with a 128K token context window.

### **Difference between Phi-3-mini and LLMs**

1. Compared to large language models (LLMs), Phi-3-mini represents a smaller, more streamlined version.
2. Smaller AI models like this offer cost-effective development and operation, particularly on devices like laptops and smartphones.
3. They are well-suited for resource-constrained environments, such as on-device and offline inference scenarios. They are also ideal for tasks requiring fast response times, such as chatbots or virtual assistants.
4. Phi-3-mini can be tailored for specific tasks, achieving high accuracy and efficiency.
5. SLMs typically undergo targeted training, requiring less computational power and energy compared to LLMs. They also excel in inference speed and latency due to their compact size, making them appealing to smaller organizations and research groups.

### **4.Symbol Loading Unit (SLU)**

- Recently, the Supreme Court dismissed a request to verify 100% of Voter Verifiable Paper Audit Trail (VVPAT) slips alongside Electronic Voting Machine (EVM) counts.
- Instead, the Court ordered the Election Commission of India (ECI) to secure and store the Symbol Loading Unit (SLU) safely for 45 days following the announcement of the election results.

### **EVM Brochure**

1. About SLU: It is a matchbox-sized device connected to a laptop or personal computer to load a bitmap file containing the candidates' names, serial numbers, and symbols.  
It is then connected to the VVPAT to transfer that file onto the paper audit machine under the supervision of a district election officer.
2. When they were introduced: Symbol Loading Units (SLUs) were introduced alongside Voter-Verified Paper Audit Trails (VVPATs) about a decade ago.
3. Significance:
  - a) VVPATs enable voters to confirm their vote choice by printing a slip with the party symbol they selected.
  - b) It actively loads candidate symbols and information onto VVPAT and ballot units, ensuring accurate representation during the voting process.
4. At which point in the election process are SLUs used:

- SLUs are involved in the election process approximately a few days before polling commences at a specific seat. This occurs when EVMs are being commissioned, and the order of contesting candidates is finalized.
- Candidate-setting can take place between five to two days before the voting.
- Once this process is completed under the supervision of the district election officer, the SLU becomes irrelevant to the actual voting procedure.

**What happens to an SLU after symbols are loaded?**

- A limited number of Symbol Loading Units (SLUs) are utilized to load symbols onto VVPATs for each seat during multi-phase elections. It takes approximately 2 to 3 minutes for an SLU to complete this task.
- SLUs are then given to the district election officers for safekeeping until the day after voting.
- During this period, the SLUs are returned to the engineers. They use the SLUs to load symbols onto VVPATs for other seats in subsequent phases of the election.
- In the subsequent phases of a multi-phase election, an SLU is usually utilized again after completing one phase of polling. Its main task involves loading symbols onto VVPATs intended for various seats.

**5. Network as a Service (NaaS)**

In India's rapidly advancing internet economy, embracing Network as a Service (NaaS) holds promise for enhancing user experiences.

What is Network as a Service (NaaS)?

- Network as a Service (NaaS) is a cloud-like networking model where network resources are provided to customers on demand. It offers networking functionality without the need for customers to invest in hardware or manage infrastructure directly.
- With over 850 million active internet users and a digital economy projected to contribute 20% to GDP by 2026, NaaS offers a cloud-like networking model, providing on-demand network resources without the need for direct infrastructure management.

Other such terminologies:

Concept Explanation

Example

SaaS	Software as a Service (SaaS) delivers software applications over the internet.	Google Workspace (formerly G Suite), Microsoft Office 365, Salesforce, Dropbox
PaaS	Platform as a Service (PaaS) provides a platform allowing customers to develop, run, and manage applications without dealing with infrastructure.	Heroku, Microsoft Azure App Service, Google App Engine
IaaS	Infrastructure as a Service (IaaS) delivers virtualized computing resources over the Internet, allowing users to rent servers, storage, and networking resources.	Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), DigitalOcean

**6. Climate Technology Centre and Network (CTCN)**

The Climate Technology Centre and Network (CTCN) celebrates its 10-year anniversary as a key player in advancing climate technology and innovation.

About Climate Technology Centre and Network (CTCN):

- Established as the implementation arm of the United Nations Framework Convention on Climate Change (UNFCCC) Technology Mechanism and hosted by the UN Environment Programme (UNEP), the CTCN facilitates the development and transfer of environmentally sound technologies for low-carbon and climate-resilient development.
- It operates through a global network of over 760 civil society, finance, private sector, and research institutions, providing technical assistance and capacity building to developing countries upon request.
- Over the past decade, the CTCN has funded over 300 technical assistance projects across 112 developing nations, supporting them in meeting their sustainable development commitments under the Paris Agreement.

- Through projects spanning various sectors such as green building standards, drought risk modelling, industrial energy efficiency, and policy development for e-mobility, the CTCN aims to catalyse climate resilience and innovation globally.

**ANSWER WRITING**

**Q. “Discuss the factors contributing to the growth of nationalist organizations in British India from 1858 to 1905 and how they moulded the freedom movement.”**

The period from 1858 to 1905 in British India witnessed the growth of nationalist organizations. They include various political, social, and intellectual groups that emerged during this period with the aim of advocating for Indian rights, national identity, and self-rule.

**Key factors that contributed to the growth of nationalist organizations during this period:**

- **British Colonial Policies:** Such as Doctrine of Lapse, racism, imposition of heavy taxation on Indians etc.
- **Political, administrative and economic unification** of the country with uniform set of laws
- **Impact of International Movements:** The growth of nationalist organizations in India was influenced by global movements for freedom and democracy, such as the American Revolution and the French Revolution.
- **Progressive character of socio-religious movements** that removed social evils that divided society. Example- Satya Sodhak Samaj.
- **Spread of Education:** The spread of modern and progressive education which promoted self-respect among Indians. Example- Setting up of universities in Bombay, Calcutta and Madras in 1857.
- **Role of Intellectuals and Leaders:** Influential intellectuals and leaders like Dadabhai Naoroji, and Surendranath Banerjee played a significant role in advocating for Indian rights, national identity, and self-rule.
- **Influence of Western Thought:** Indian intellectuals, educated in the British system, were inspired by Western political philosophies and sought to apply them to the Indian context.
- **Role of Press and Publications:** Bengal Gazette, Amrita Bazar Patrika, and Kesari became platforms for nationalist leaders to express their views, raise awareness, and mobilise public opinion against British policies.
- **Formation of Societies and Associations:** Various societies and associations, such as the Indian Association and the Poona Sarvajanik Sabha, were established during this period.

**Growth of nationalist organisations during this period shaped the freedom movement in multiple ways:**

- **Building a National Identity:** They sought to create a shared sense of national identity among Indians, emphasising the common historical and cultural heritage of the country.
- **International Exposure and Support:** Leaders like Dadabhai Naoroji and A.O. Hume represented Indian interests on international platforms and sought to garner. Dadabhai Naoroji established the East India Association. He was also an MP in the British Parliament.
- **Start of Constitutional Struggle:** Organizations like the Indian National Congress (INC) utilized constitutional methods like petitions, resolutions, and public campaigns to demand reforms and press for self-rule.
- **Political Education of People:** Nationalist organizations organized public meetings, lectures, and seminars to raise awareness about colonial policies, rights.
- **Unity and Collaboration:** For instance, INC (1885) emerged as the most prominent political organisation, representing diverse interests and aspirations of Indians.

Thus, the growth of nationalist organizations in British India from 1858 to 1905 laid the foundation for efforts of extremists’ leaders and subsequently for the Gandhian struggle ultimately leading to India’s independence in 1947.

**MCQs**

1. Consider the following:
  1. Virtual Private Networks
  2. Multiprotocol Label Switching Connections
  3. Firewall Appliances
  4. Load Balancers
 How many of the above can be replaced by Network as a Service (NaaS)?

- a) Only one  
b) Only two  
c) Only three  
**d) All four**
2. Which one of the following best describes the primary action of antihistamines?  
a) They increase the release of histamine from mast cells.  
**b) They block the H1 receptor sites on cells, preventing histamine from attaching.**  
c) They promote the synthesis of histamine in the immune system.  
d) They convert histamine into a less active form that does not cause allergic symptoms.
3. What is the role of the Symbol Loading Unit (SLU) in the context of VVPAT usage during elections?  
a) It records the votes cast by the voters  
**b) It is used for loading candidate symbols onto the VVPATs**  
c) It tabulates and displays election results  
d) It serves as a backup memory for EVMs
4. How many of the following statements correctly describe the impact of fairness creams containing mercury as mentioned in the article?  
1. Inhibiting melanin production, which lightens skin tone.  
2. Psychological effects such as anxiety and depression.  
3. Improve the skin's resistance to bacterial and fungal infections.  
How many of the above statements are correct?  
a) Only one  
**b) Only two**  
c) Only three  
d) None
5. Consider the following statements about the Marrakesh Agreement:  
1. It was signed in 1986 to establish the World Resources Institute (WTI).  
2. It primarily focuses on environmental conservation.  
Which of the statements given above is/are correct?  
(a) 1 only  
(b) 2 only  
(c) Both 1 and 2  
**(d) Neither 1 nor 2**
6. 'Global Report on Food Crisis' (GRFC) is published by the  
(a) FAO  
(b) UNDP  
(c) Oxfam  
**(d) Food Security Information Network**
7. "Towards a Regenerative Blue Economy – Mapping the Blue Economy" is published by which of the following?  
(a) UNEP  
(b) IUCN  
(c) WTO  
(d) UNESCO
8. Consider the following statements:  
1. NaaS enables organizations to outsource the provisioning and management of their network infrastructure to third-party service providers.  
2. NaaS eliminates the need for organizations to invest in and maintain their own networking hardware.  
3. NaaS provides on-demand access to networking resources such as bandwidth, routing, and security services.  
How many of the above statements are correct?  
(a) Only one  
(b) Only two  
**(c) All three**  
(d) None
9. Consider the following statements about the Climate Technology Centre and Network (CTCN):  
1. It is the implementation arm of the Technology Mechanism of the United Nations Framework Convention on Climate Change.  
2. It is hosted by the International Union for Conservation of Nature.  
3. It facilitates the development and transfer of environmentally sound technologies for low-carbon and climate-resilient development.  
How many of the above statements are correct?  
(a) Only one  
**(b) Only two**  
(c) All three  
(d) None
10. Consider the following statements:  
1. Blue Whales are the smallest species of whales.  
2. Blue Whales primarily feed on plankton.  
3. Blue Whales are known for their loud vocalizations.  
How many of the above statements are correct?  
(a) Only one  
**(b) Only two**  
(c) All three  
(d) None