

# Solutions

DATE : 9<sup>th</sup> – 15<sup>th</sup> Sept

## 1. Solution: c)

- **Statement 1:** Correct. Florence Nightingale was a social reformer and is widely recognized as the founder of modern nursing.
- **Statement 2:** Incorrect. She gained fame for her work during the *Crimean War*, not the First World War. She organized care for wounded soldiers, improving sanitation and reducing mortality rates.
- **Statement 3:** Correct. Nightingale established the first scientifically based nursing school at St. Thomas' Hospital in London, setting the standards for modern nursing education.

## 2. Solution: a)

- The **PM E-Drive Scheme** aims to promote the adoption of electric vehicles (EVs) by providing financial support to public transport agencies, particularly for the procurement of 14,028 e-buses in nine major cities.
- **Implementation:** Handled by Convergence Energy Services Limited (CESL).
- The scheme also includes funds for:
  - Fast chargers and electric trucks.
  - Modernization of EV testing agencies.
- **Implemented by:** Ministry of Heavy Industries, not the Ministry of Renewable Energy.

- The scheme supports both public and private sectors, including the development of charging infrastructure.

## 3. Solution: a)

- The **PM E-Drive Scheme** is focused on promoting electric buses and includes:
  - Financial support for public transport, particularly e-buses.
- **Implementation:** By the Ministry of Heavy Industries, not the Ministry of Renewable Energy.
- The scheme includes subsidies for buyers and manufacturers, and support for charging infrastructure.

## 4. Solution: b)

- **Myristica swamp forests** provide several ecological benefits:
  - Contribute to groundwater recharge by acting as natural sponges, absorbing and storing water.
  - Help in flood mitigation.
  - Aid in carbon sequestration, which helps combat climate change.
  - These forests are not used for agriculture and do not promote invasive species or deplete soil nutrients.

## 5. Solution: a)

- The **ONDC Saarthi app** is designed to:

- Enhance accessibility for businesses by providing real-time multilingual support.
- Utilize features like translation, transliteration, and voice recognition in various languages (e.g., Hindi, English, Marathi, Bangla, Tamil).
- Focuses on breaking language barriers to expand market reach, especially in underserved areas.

### 6. Solution: b)

- The **Bhadra Tiger Reserve (BTR)** faces environmental threats from:
  - The rapid spread of the invasive weed *Mikania micrantha* (the “mile-a-minute” vine), which covers 10%-15% of the reserve, threatening biodiversity by smothering native plants.
- Other threats like deforestation, poaching, and mining are less immediate concerns compared to the impact of this invasive species.

### 7. Solution: b)

- **Correct Statements:**
  - **Statement 1:** Correct. Salt pan lands form through the evaporation of water, leaving behind salt and mineral deposits.
  - **Statement 3:** Correct. Coastal salt pans form from the evaporation of seawater in shallow basins.
- **Incorrect Statement:**
  - **Statement 2:** Incorrect. Salt pan lands are not exclusive to desert environments; they also exist in coastal areas.

### 8. Solution: d)

- All statements are incorrect:

- The scheme is not limited to promoting electric vehicles for personal use; it also includes support for public transport.
- Implemented by the Ministry of Heavy Industries, not the Ministry of Renewable Energy.
- Provides financial support for charging infrastructure development.

### 9. Solution: a)

- **Mission Mausam** is implemented by the **National Centre for Medium-Range Weather Forecasting (NCMRWF)** under the Ministry of Earth Sciences (MoES), with support from IMD and the Indian Institute of Tropical Meteorology to enhance weather and climate prediction capabilities.

### 10. Solution: d)

- All statements are incorrect:
- The forest is not used for commercial timber or firewood; it is protected for its ecological significance.
- It provides important environmental benefits like groundwater recharge, flood mitigation, and carbon sequestration, beyond its cultural and religious value.
- There has been no commercialization for tourism; the focus is on conservation efforts.

### 11. Solution: a)

- **Sakthan Thampuran**, also known as Raja Rama Varma IX, ruled the Cochin kingdom from 1790 to 1805 and significantly shaped the region.
- Born in 1751, he was known for his strong leadership and strategic decisions.

- Thampuran maintained friendly relations with the Dutch and the British, securing the kingdom's independence from Mysore.
- He **relocated the capital** from **Thrippunithura to Thrissur**, developing the city's infrastructure and inviting merchants of all religions and British officials.
- He also initiated the famous **Thrissur Pooram festival** in 1797, enhancing its cultural significance.
- He is credited with **eliminating crime** in the kingdom, **reforming temple management**, and strengthening the kingdom's finances.
- **Statement 2** is incorrect; Thampuran did not sign a treaty with Tipu Sultan but instead maintained friendly relations with the British and the Dutch.

### 12. Solution: d)

- **Presbyopia** is caused by the **loss of elasticity in the lens** of the eye, making it harder to focus on close objects. This condition is a natural part of aging, usually beginning around the age of 40. The lens becomes less flexible, reducing its ability to change shape and focus on nearby items, which is the primary cause of presbyopia.

### 13. Solution: c)

- **Siddha medicine** is a traditional system of healing that originated in **Tamil Nadu**, South India. It is one of the oldest medical systems known to humanity, focusing on the balance of elements in the body for health and well-being. Tamil Nadu has been a significant center for developing and practicing this ancient system.

### 14. Solution: d)

- SEBI has updated the rules for the registration and eligibility of Foreign Venture Capital Investors (FVCIs).
- The process of registering FVCIs and managing post-registration activities will be handled by **designated depository participants (DDPs)**, like the system for Foreign Portfolio Investors (FPIs).
- **Key updates include:**
- FVCIs must hold their investments in **demat form starting January 1, 2025**.
- Resident Indians (RIs), Non-Resident Indians (NRIs), and Overseas Citizens of India (OCI) can contribute to an FVCI, but with limitations: no single individual can contribute more than 25%, and their combined contribution should not exceed 50%.
- FVCIs must appoint a domestic custodian for monitoring and reporting to SEBI.

### 15. Solution: c)

- **Statement 1** is correct; Siddha medicine is based on balancing the five elements—earth, water, fire, air, and ether—within the body to maintain health and well-being.
- **Statement 2** is incorrect; Siddha medicine does not avoid the use of minerals and metals; these substances play a crucial role in certain Siddha treatments alongside herbal remedies.
- **Statement 3** is incorrect; Siddha medicine adopts a holistic approach that includes physical, mental, and spiritual healing.

### 16. Solution: b)

- **Statement 1** is correct; presbyopia affects the ability to focus on nearby objects due to the loss of flexibility in the lens.
- **Statement 2** is incorrect because presbyopia is not typically seen in young adults and progresses gradually as people age, usually starting around 40 years of age.
- **Statement 3** is correct; multifocal lenses, which provide different lens powers for near and distant vision, are one option used to manage presbyopia.

### 17. Solution: b)

- **Statements 1 and 2** are correct:
  - **EPR** holds producers accountable for the environmental impact of their products throughout their lifecycle, including waste management and recycling.
  - **Statement 3** is incorrect; EPR does not eliminate the role of consumers; it complements consumer responsibility by ensuring that producers provide systems for proper disposal and recycling.

### 18. Solution: c)

- **Statement 1** is correct, as the **REAIM summit** focuses on AI's implications beyond just autonomous weapons, including broader applications in military strategy, defense systems, and warfare.
- **Statement 3** is also correct; the US promotes responsible AI use through national guidelines and a UN resolution.

- **Statement 2** is incorrect; India has observed developments at the summit but has not actively shaped norms for military AI.

### 19. Solution: d)

- **Statement 1** is correct; Sakthan Thampuran invited merchants from various religious communities and British officials to Thrissur, enhancing the city's commercial and administrative significance.
- **Statement 2** is incorrect; there is no direct evidence that Thampuran introduced specific land revenue reforms.
- **Statement 3** is correct; he focused on strengthening the kingdom's finances and developing infrastructure, contributing to the Cochin kingdom's economic and administrative stability.

### 20. Solution: a)

- Under the new SEBI framework, the registration of **Foreign Venture Capital Investors (FVCIs)** is handled by **Designated Depository Participants (DDPs)**. This process mirrors that already in place for Foreign Portfolio Investors (FPIs), with DDPs also managing post-registration activities for FVCIs.

### 21. Solution: c)

- The **reduction of sea ice in the Central Arctic** leads to more heat being transferred from the ocean to the atmosphere, which strengthens **Rossby waves**. This alteration in atmospheric circulation causes high pressure over northwest India and low pressure over the Mediterranean, affecting the Asian jet stream. Consequently, there is increased rainfall in northern and central



India, while western and peninsular regions may experience reduced rainfall.

### 22. Solution: d)

- The **Air Quality Management Exchange Platform (AQMx)**, developed by the **Climate and Clean Air Coalition (CCAC)**, aims to promote global cooperation in improving air quality. It equips air quality managers with tools and guidance to meet WHO Air Quality Guidelines, fosters best practice sharing, and supports policy development for enhanced air quality and health outcomes worldwide.

### 23. Solution: a)

- **Statement 1** is correct because the melting of Arctic ice releases freshwater, which disrupts the **thermohaline circulation** that drives global ocean currents and regulates climate patterns.
- **Statement 2** is correct as **melting permafrost** releases methane, a potent greenhouse gas contributing to global warming.
- **Statement 3** is incorrect because the **melting of Antarctic ice** has a significant impact on global sea levels due to its vast ice volume.

### 24. Solution: a)

- The **WHO Air Quality Guidelines (AQG)** regulate pollutants such as **PM2.5, O<sub>3</sub> (ozone), NO<sub>2</sub>, SO<sub>2</sub>, and CO**. Ozone (O<sub>3</sub>) is a critical pollutant in air quality management due to its direct impact on human health, unlike methane and carbon dioxide, which

are greenhouse gases and not directly regulated under the AQGs.

### 25. Solution: b)

- **Statement 1** is correct: The **elongated tortoise** is native to Southeast Asia and rarely found in India.
- **Statement 2** is correct: The species is listed as “Critically Endangered” on the IUCN Red List due to habitat destruction and illegal wildlife trade.
- **Statement 3** is incorrect: The tortoise was spotted in the Damdama area in the **Aravallis**, not in **Sultanpur National Park**.

### 26. Solution: d)

- **Statement 1** is correct: The **Parliamentary Committee on Official Language (PCOL)** was established under Section 4 of the **Official Languages Act, 1963**.
- **Statement 3** is correct: One of the functions of the Committee is to review the progress of adopting Hindi for official purposes.
- **Statement 2** is incorrect: The Committee consists of **30 members** (20 from the Lok Sabha and 10 from the Rajya Sabha), not the other way around.

### 27. Solution: c)

- The **Aravalli Range** acts as a natural green wall and an **ecotone** between the arid **Thar Desert** and the fertile **Gangetic Plain**, influencing local climates and ecosystems and preventing desertification in the Gangetic region. It spans from Gujarat to Delhi, covering parts of Rajasthan, Haryana, and Gujarat.

### 28. Solution: b)

- **Statement 1** is correct: **Amphibious operations** require coordination between land, naval, and air forces to project military power from the sea to land.
- **Statement 3** is correct: The **Indian Armed Forces** have developed an **Amphibious Operations Doctrine** for conducting operations in the Indian Ocean Region.
- **Statement 2** is incorrect: Amphibious operations can be conducted during both wartime and peacekeeping missions.

### 29. Solution: d)

- **Statement 1** is correct: **Warm Ocean waters** in the Western Pacific provide the conditions necessary for typhoon formation.
- **Statement 2** is correct: **Monsoonal winds** often intensify typhoons, especially during the peak season.
- **Statement 3** is incorrect: Vietnam and the Philippines are not shielded but are highly vulnerable to the effects of typhoons due to their location along the typhoon belt.

### 30. Solution: c)

- Vietnam shares its land borders with **China** to the north, **Laos** to the west, and **Cambodia** to the southwest, making it strategically important in Southeast Asia. The country also has maritime borders via the **South China Sea**, a region of significant economic and geopolitical importance.

### 31. Solution: d)

- The **Clean Seas Campaign** is a global initiative launched by the United Nations

Environment Programme (UNEP) aimed at combating marine plastic pollution. The campaign focuses on raising awareness, promoting action, and implementing solutions to reduce plastic litter in oceans worldwide, engaging various stakeholders like governments, industries, and civil society.

### 32. Solution: b)

- **Correct Statements:**

- **Statement 1:** The Sahariya tribe traces its historical origins to the days of the Ramayana and earlier.
- **Statement 2:** The Sahariyas speak a dialect influenced by Hindi and Brij Bhasha.

- **Incorrect Statement:**

- **Statement 3:** The Sahariya tribe practices Hinduism, not Buddhism.

### 33. Solution: c)

- The first 'teal carbon' study in India was conducted at **Keoladeo National Park**, Rajasthan. This study aims to understand the potential of freshwater wetlands in climate adaptation and resilience, emphasizing their role in regulating greenhouse gases and mitigating climate change.

### 34. Solution: a)

- **Correct Statement:**

- **Statement 2:** The Standing Committee on Economic Statistics (SCES) focuses primarily on advising survey methodology and finalizing survey tabulation plans.

- **Incorrect Statements:**

- **Statement 1:** The SCES was established by the Ministry of Statistics and Programme Implementation (MoSPI), not the Ministry of Finance.
- **Statement 3:** The SCES is not a permanent committee, but a temporary one formed to address specific critical statistical issues.

### 35. Solution: c)

- **Correct Statements:**

- **Statement 1:** SiC has excellent thermal conductivity and mechanical strength.
- **Statement 2:** It is widely used in applications like semiconductor devices, heat exchangers, and ballistic armor.

- **Incorrect Statement:**

- **Statement 3:** SiC is not a naturally occurring crystalline compound; it is synthetic.

### 36. Solution: d)

- **Correct Statements:**

- **Statement 2:** Bioplastics are derived from renewable biomass sources such as corn starch and sugarcane.
- **Statement 3:** They help reduce dependency on fossil fuels for plastic production.

- **Incorrect Statement:**

- **Statement 1:** Not all bioplastics are biodegradable or compostable; some can behave like conventional plastics and persist in the environment.

### 37. Solution: d)

- The **BepiColombo mission** is a collaboration between the **European Space Agency (ESA)** and the **Japan Aerospace Exploration Agency (JAXA)**. The mission aims to study Mercury's composition, geology, and magnetic field, with the spacecraft scheduled to enter orbit around Mercury in 2026.

### 38. Solution: c)

- **Teal carbon** refers to carbon stored in **non-tidal freshwater wetlands**, which includes carbon sequestered in vegetation, microbial biomass, and organic matter, highlighting the role of these ecosystems in mitigating climate change.

### 39. Solution: b)

- **Correct Statements:**

- **Statement 1:** Keoladeo National Park is in Bharatpur, Rajasthan, and is a UNESCO World Heritage Site.

- **Statement 3:** The Gambhir and Banganga rivers flow through the park, supporting its ecosystem.

- **Incorrect Statement:**

- **Statement 2:** Keoladeo National Park, along with Chilika Lake, was declared India's first Ramsar site in 1981, not Vembanad Lake.

### 40. Solution: a)

- Keoladeo National Park is renowned for hosting the rare and endangered **Siberian Crane**, which migrates to the park from the northern hemisphere, making it a crucial sanctuary for various migratory bird species.



### 41. Solution: c)

- Helium is considered a non-renewable resource on Earth because, once released into the atmosphere, it escapes into space due to its low atomic mass and inert nature. Helium is primarily extracted from natural gas deposits, where it is produced through the radioactive decay of elements like uranium. Earth's atmosphere cannot retain helium, making its supply finite and non-renewable.

### 42. Solution: d)

- **Article 217** of the Indian Constitution provides for the appointment of judges to the High Courts. The President of India appoints High Court judges based on the recommendations of the Collegium system, which includes the Chief Justice of the High Court and two senior-most judges of the High Court. This process ensures an independent judiciary by involving senior judges in the appointment.

### 43. Solution: d)

- **Statement 1** is correct because Alzheimer's Disease is a progressive neurological disorder that leads to memory loss and cognitive decline, primarily affecting older adults.
- **Statement 2** is also correct because light pollution disrupts sleep by interfering with melatonin production, which may contribute to cognitive decline and an increased risk of Alzheimer's Disease.

### 44. Solution: a)

- The primary goal of planetary protection is to **prevent the contamination** of both Earth's biosphere and other celestial bodies by alien microbes or biological material during space missions. This ensures that space missions do not introduce potentially harmful elements to other planets or bring back harmful organisms to Earth. These guidelines are established under Article IX of the 1967 Outer Space Treaty.

### 45. Solution: b)

- **Statement 2** is correct as NIDHI is implemented through incubators associated with the National Science & Technology Entrepreneurship Development Board (NSTEDB), which supports startups.
- **Statement 3** is also correct, as NIDHI-iTBI is a component of NIDHI focused on converting innovations into startups.
- **Statement 1** is incorrect because NIDHI was launched by the Department of Science & Technology (DST), not the Ministry of Finance.

### 46. Solution: c)

- Helium was first detected in **1868 in the sunlight during a solar eclipse**. Astronomers Jules Janssen and Norman Lockyer identified a new spectral line while observing the Sun, leading to the discovery of helium, named after "Helios," the Greek word for the Sun. It was later confirmed on Earth in uranium ore.



47. **Solution: a)**

- **Statement 1** is correct, as India's Mars Orbiter Mission (Mangalyaan) was designed to prevent contamination of Mars.
- **Statement 3** is also correct because ISRO collaborates with global space agencies to enhance planetary protection efforts.
- **Statement 2** is incorrect; India is a signatory to the Outer Space Treaty and follows its planetary protection guidelines.

48. **Solution: b)**

- **Statement 1** is incorrect.
- **Statement 2** is correct because the Supreme Court Collegium recommends the appointment of High Court judges.
- **Statement 3** is correct.
- The content of the consultation in the Collegium system is not open to judicial review, though the process of "effective consultation" may fall within judicial scrutiny.

49. **Solution: b)**

- **Statement 1** is correct, as the Collegium system was established through judgments of the Supreme Court.
- **Statement 3** is correct, as the appointment of the Chief Justice of India considers the senior-most judge of the Supreme Court.
- **Statement 2** is incorrect because the Collegium system does not introduce open competition for the appointment of judges.

50. **Solution: b)**

- **Statement 2** is correct as helium is a rare gas on Earth and is mainly produced through the radioactive decay of uranium.
- **Statement 3** is also correct because helium's low boiling point makes it essential for use in cryogenics and MRI scanners.
- **Statement 1** is incorrect; helium on Earth is not primarily produced through nuclear fusion but through radioactive decay.

