

Q1. Consider the following statements regarding the Corporate Average Fuel Efficiency (CAFE) norms:

CAFE norms prescribe emission limits for every individual passenger vehicle model manufactured by an automobile company.

CAFE norms regulate the sales-weighted average fuel efficiency and carbon dioxide (CO₂) emissions of an automobile manufacturer's entire fleet of passenger vehicles sold during a financial year.

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

Answer: B

Explanation

CAFE (Corporate Average Fuel Efficiency) norms regulate the **sales-weighted average fuel efficiency and CO₂ emissions** of an automobile manufacturer's fleet rather than imposing emission limits on every individual vehicle model.

- **Statement 1 is incorrect.** CAFE norms do not prescribe separate emission standards for each model. Manufacturers can continue selling relatively higher-emission vehicles provided the overall fleet average remains within the prescribed target.
- **Statement 2 is correct.** Compliance is assessed based on the manufacturer's total annual passenger vehicle fleet, encouraging the adoption of fuel-efficient technologies, hybrid vehicles, electric vehicles, lightweight materials, and improved engine efficiency.

Q2. Consider the following statements regarding Exercise Pitch Black 2026:

Exercise Pitch Black is a biennial multinational air warfare exercise hosted by the Royal Australian Air Force.

The exercise focuses on enhancing interoperability among participating air forces through complex air combat missions and joint operational planning.

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

Answer: C

Explanation

Exercise Pitch Black is one of the world's premier multinational air combat exercises conducted every two years by the **Royal Australian Air Force (RAAF)** in northern Australia.

- **Statement 1 is correct.** It is a biennial multinational air warfare exercise hosted by Australia.
- **Statement 2 is correct.** The exercise includes offensive and defensive counter-air operations, air-to-air refuelling, airborne early warning, joint mission planning, and other high-intensity air combat scenarios designed to improve interoperability and operational readiness among participating air forces, including the Indian Air Force.

Q3. Consider the following statements regarding Proton Exchange Membrane (PEM) Fuel Cell technology:

At the anode, hydrogen molecules are split into protons and electrons with the help of a catalyst.

The polymer electrolyte membrane allows only positively charged protons to pass through while preventing electrons from crossing it.

At the cathode, oxygen combines with protons and electrons to produce water and heat as the only by-products.

Which of the statements given above are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1, 2 and 3
- D. 1 and 3 only

Answer: C

Explanation

A Proton Exchange Membrane (PEM) fuel cell produces electricity through an electrochemical reaction between hydrogen and oxygen without combustion.

- **Statement 1 is correct.** At the anode, hydrogen gas is split into protons and electrons using a platinum-based catalyst.
- **Statement 2 is correct.** The polymer electrolyte membrane selectively allows protons (H^+) to pass while blocking electrons, forcing them through an external circuit to generate electricity.
- **Statement 3 is correct.** At the cathode, oxygen reacts with incoming protons and electrons to form water, while the reaction also releases heat. Consequently, water and heat are the only by-products.

Q4. Consider the following statements regarding the World Artificial Intelligence Cooperation Organisation (WAICO):

WAICO is a United Nations agency established under the administrative oversight of the UN General Assembly.

WAICO seeks to promote inclusive international cooperation in artificial intelligence governance and capacity building, including participation from developing countries.

WAICO explicitly rejects open-source artificial intelligence systems in favour of proprietary software models.

Which of the statements given above are correct?

- A. 1 only
- B. 2 only
- C. 2 and 3 only
- D. 1 and 3 only

Answer: B

Explanation

The World Artificial Intelligence Cooperation Organisation (WAICO) is a recently launched international initiative aimed at strengthening global cooperation in AI governance, standards, research, and capacity building.

- **Statement 1 is incorrect.** WAICO is not a United Nations agency and was not established under the UN General Assembly.
- **Statement 2 is correct.** It promotes broad international participation, particularly from developing countries, and encourages collaborative AI governance.
- **Statement 3 is incorrect.** WAICO does not reject open-source AI systems and instead supports collaborative and inclusive approaches to AI development.

Q5. Consider the following statements regarding Operation Southern Readiness 26-2:

Statement I: Operation Southern Readiness 26-2 aims to enhance international maritime security, interoperability, and cooperation among partner navies.

Statement II: The exercise is conducted jointly by the Indian Navy and the Combined Maritime Forces (CMF) and includes classroom instruction, simulator-based training, practical exercises, and sea-based operations.

Which one of the following is correct?

- A. Both Statement I and Statement II are correct, and Statement II is the correct explanation of Statement I.
- B. Both Statement I and Statement II are correct, but Statement II is not the correct explanation of Statement I.
- C. Statement I is correct, but Statement II is incorrect.
- D. Statement I is incorrect, but Statement II is correct.

Answer: A

Explanation

Operation Southern Readiness 26-2 is a multinational maritime security training initiative hosted by the Indian Navy in partnership with the Combined Maritime Forces (CMF).

- **Statement I is correct.** The exercise seeks to improve maritime security, capacity building, interoperability, and cooperation among participating navies.
- **Statement II is correct.** The programme includes classroom sessions, simulator-based training, onboard practical exercises, maritime law, maritime domain awareness, boarding procedures, firefighting, damage control, and other operational activities.
- **Statement II correctly explains Statement I** because these activities directly strengthen operational coordination, professional competence, and interoperability among participating maritime forces.

Q6. Consider the following statements regarding hybrid propulsion systems combining Proton Exchange Membrane (PEM) fuel cells with Lithium Iron Phosphate (LFP) batteries:

The PEM fuel cell provides continuous power during normal cruising operations.

The LFP battery supplies additional power during acceleration and stores energy recovered through regenerative braking.

This hybrid architecture improves energy efficiency while reducing stress on the fuel cell.

Which of the statements given above are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

Answer: D

Explanation

Hybrid propulsion systems integrate PEM fuel cells and LFP batteries to exploit the strengths of both energy sources.

- **Statement 1 is correct.** The PEM fuel cell supplies steady and continuous electrical power during cruising, where power demand remains relatively stable.
 - **Statement 2 is correct.** The LFP battery delivers high power during acceleration, hill climbing, and other peak-load situations while storing energy recovered through regenerative braking.
 - **Statement 3 is correct.** The combined architecture improves overall energy efficiency, reduces hydrogen consumption, minimizes rapid load fluctuations on the fuel cell, extends fuel cell life, and enhances the reliability of the propulsion system.
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Q7. Consider the following statements regarding the safety features incorporated in onboard hydrogen fuel-cell power systems:

Active ventilation systems rapidly disperse leaked hydrogen to prevent the accumulation of flammable gas concentrations.

Automatic shut-off valves linked to leak detectors, flame sensors, and thermal sensors isolate the hydrogen supply during abnormal conditions.

Hydrogen fuel is stored in high-pressure composite cylinders designed to withstand high operating pressures and mechanical impacts.

Which of the statements given above are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

Answer: D

Explanation

Hydrogen fuel-cell systems incorporate multiple layers of safety because hydrogen is highly flammable and is typically stored under high pressure.

- **Statement 1 is correct.** Active ventilation systems quickly disperse leaked hydrogen, which is lighter than air, thereby preventing the formation of combustible gas concentrations in enclosed spaces.
- **Statement 2 is correct.** Automatic shut-off valves, integrated with hydrogen leak detectors, flame sensors, and thermal sensors, immediately isolate the hydrogen supply whenever leaks, excessive temperatures, or fire are detected.
- **Statement 3 is correct.** Hydrogen is stored in specially designed high-pressure composite cylinders capable of safely withstanding high operating pressures, severe mechanical impacts, and stringent international safety requirements.

Together, these safety systems significantly reduce the risks of fire and explosion, enabling the safe use of hydrogen fuel cells in trains, buses, and passenger vehicles.

Q8. Consider the following statements regarding the formation of geothermal fluids at the Puga Valley geothermal field in Ladakh:

Meteoric water circulates deep underground through tectonic fractures associated with the Indus Suture Zone.

The circulating groundwater is heated by shallow crustal magmatic heat and an abnormally high geothermal gradient before returning to the surface.

Which of the statements given above are correct?

- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2

Answer: C

Explanation

The Puga Valley geothermal field is one of India's most promising geothermal energy resources, where geothermal fluids are generated through deep hydrothermal circulation.

- **Statement 1 is correct.** Rainwater and glacial meltwater (meteoric water) percolate deep underground through tectonic fractures associated with the Indus Suture Zone.
- **Statement 2 is correct.** At depth, the water is heated by shallow crustal magmatic heat and an unusually high geothermal gradient resulting from the ongoing collision of the Indian and Eurasian plates. The heated fluids subsequently rise to the surface through fractures as hot springs, steam vents, and fumaroles.

Q9. Consider the following statements regarding the Dual Frequency Synthetic Aperture Radar (DFSAR) onboard the Chandrayaan-2 orbiter:

DFSAR is the world's first dual-frequency fully polarimetric Synthetic Aperture Radar placed in lunar orbit.

As an active microwave radar, DFSAR transmits its own radar signals and can image permanently shadowed lunar regions without requiring sunlight.

Which of the statements given above are correct?

- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2

Answer: C

Explanation

The Dual Frequency Synthetic Aperture Radar (DFSAR) is one of the key scientific instruments onboard the Chandrayaan-2 orbiter for investigating the Moon's polar regions.

- **Statement 1 is correct.** DFSAR is the world's first dual-frequency (L-band and S-band) fully polarimetric Synthetic Aperture Radar operating in lunar orbit, enabling detailed studies of surface and subsurface characteristics.
- **Statement 2 is correct.** Being an active microwave radar, DFSAR transmits its own radar pulses and records the reflected signals. Consequently, it can image permanently shadowed regions (PSRs), where sunlight never reaches, making it particularly useful for detecting potential subsurface water-ice deposits.

Q10. Consider the following statements:

Statement I: After the election of the leader of a State Legislative Party or coalition, the party generally submits a letter or resolution to the Governor claiming majority support and seeking an invitation to form the government.

Statement II: The Governor may require the newly appointed Chief Minister to prove the majority on the floor of the Legislative Assembly within a reasonable timeframe, subject to constitutional principles and judicial review.

Which one of the following is correct?

- A. Both Statement I and Statement II are correct, and Statement II is the correct explanation of Statement I.
- B. Both Statement I and Statement II are correct, but Statement II is not the correct explanation of Statement I.
- C. Statement I is correct, but Statement II is incorrect.
- D. Statement I is incorrect, but Statement II is correct.

Answer: B

Explanation

The formation of a State government involves two distinct constitutional processes: staking a claim to form the government and subsequently proving majority support on the floor of the House.

- **Statement I is correct.** Once the legislative party or coalition elects its leader, it ordinarily submits a formal letter or resolution to the Governor demonstrating the support of its MLAs and requesting an invitation to form the government.
- **Statement II is correct.** The Governor may direct the newly appointed Chief Minister to establish majority support through a floor test within a reasonable period. However, this discretion is not absolute and must be exercised in accordance with constitutional conventions and is subject to judicial review, as affirmed by the Supreme Court.
- **Statement II does not explain Statement I.** The submission of a letter or resolution is part of staking a claim to form the government, whereas the floor test is a subsequent constitutional mechanism to verify whether the Chief Minister enjoys the confidence of the Legislative Assembly.

Q11. Consider the following statements regarding the Foreign Currency Non-Resident (Bank) [FCNR(B)] deposit scheme:

FCNR(B) deposits are maintained in designated foreign currencies and are not automatically converted into Indian Rupees.

These fixed-term foreign currency deposits can be opened in India by Non-Resident Indians (NRIs), Overseas Citizens of India (OCIs), and Persons of Indian Origin (PIOs), subject to applicable regulations.

Interest earned on FCNR(B) deposits is exempt from income tax in India as long as the account holder qualifies as a non-resident under Indian tax laws.

Which of the statements given above are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

Answer: D

Explanation

The **Foreign Currency Non-Resident (Bank) [FCNR(B)]** scheme enables eligible overseas Indians to maintain fixed-term deposits in designated foreign currencies, thereby protecting their savings from exchange rate fluctuations.

- **Statement 1 is correct.** FCNR(B) deposits are maintained in approved foreign currencies and are not automatically converted into Indian Rupees, unlike certain other NRI deposit accounts.
- **Statement 2 is correct.** These fixed-term deposits can be opened by eligible Non-Resident Indians (NRIs), Overseas Citizens of India (OCIs), and Persons of Indian Origin (PIOs), in accordance with the applicable regulatory framework.
- **Statement 3 is correct.** Interest earned on FCNR(B) deposits is exempt from income tax in India, provided the depositor continues to satisfy the conditions for non-resident status under the Income Tax Act.

Q12. Consider the following grounds for the disqualification of a Member of Parliament under Article 102 of the Constitution of India:

Holding an office of profit under the Government of India or the Government of any State, unless exempted by law.

Being declared to be of unsound mind by a competent court.

Being an undischarged insolvent.

Which of the above grounds are expressly provided under Article 102?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

Answer: D

Explanation

Article 102 of the Constitution lays down the constitutional grounds on which a person may be disqualified from being chosen as, or for continuing as, a Member of either House of Parliament.

- **Statement 1 is correct.** A person holding an office of profit under the Union or State Government, unless specifically exempted by Parliament, is disqualified.
- **Statement 2 is correct.** A person declared to be of unsound mind by a competent court is disqualified.
- **Statement 3 is correct.** An undischarged insolvent is also disqualified from membership of Parliament.

These constitutional grounds operate independently of additional statutory disqualifications prescribed under laws such as the Representation of the People Act, 1951.

Q13. Consider the following statements regarding the geography and hydrology of Canada:

The Canadian Shield consists predominantly of ancient Precambrian rocks and forms the geological core of the country.

The St. Lawrence River system connects the Great Lakes with the Atlantic Ocean and serves as one of North America's most important inland waterways.

Canada shares the world's longest international border with the United States, which is widely regarded as the longest undefended international border.

Which of the statements given above are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

Answer: D

Explanation

Canada possesses diverse physical features, abundant freshwater resources, and an extensive international boundary with the United States.

- **Statement 1 is correct.** The Canadian Shield is composed primarily of ancient Precambrian crystalline rocks and represents one of the oldest geological formations on Earth.
- **Statement 2 is correct.** The St. Lawrence River system forms a major commercial waterway connecting the Great Lakes with the Atlantic Ocean, facilitating international trade through the St. Lawrence Seaway.
- **Statement 3 is correct.** Canada and the United States share the world's longest international border, extending approximately **8,890 km**, commonly referred to as the world's longest **undefended** international border.

Canada also possesses one of the world's largest freshwater reserves, accounting for a significant share of global freshwater resources, while the Mackenzie River constitutes the country's longest river system. These geographic and resource advantages contribute significantly to Canada's economic and strategic importance.

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