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1) Consider the following statements regarding the health impacts of nanoplastics:

1. They can trigger cellular senescence, a condition in which cells stop dividing and contribute to chronic inflammation.
2. Their interaction with immune cells can stimulate the release of pro-inflammatory cytokines.
3. Due to their small size, nanoplastics are easily metabolized and eliminated by the human liver within 24 hours.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (b) Only two

Explanation

- Statement 1 is correct: Exposure to nanoplastics triggers a cascade of toxicological effects, including cellular senescence (aggravated cellular aging). In this state, cells remain metabolically active but stop dividing, often secreting factors that cause chronic inflammation in surrounding tissues.
- Statement 2 is correct: Nanoplastics interact directly with immune cells (like macrophages). This interaction can trigger an immune response, leading to the release of pro-inflammatory cytokines, which are linked to the pathogenesis of cardiovascular and neurodegenerative diseases.
- Statement 3 is incorrect: Nanoplastics are not easily metabolized. In fact, they are highly persistent. Because of their small size and ability to enter cells and bypass biological barriers, they tend to accumulate in tissues and organs over time (bioaccumulation) rather than being rapidly excreted. Their long-term persistence in the body is one of the primary reasons for concern regarding chronic health effects.

2) With reference to the Cold Desert Biosphere Reserve, consider the following statements:

1. It is India's first high-altitude biosphere reserve to be included in the UNESCO World Network of Biosphere Reserves (WNBR).
2. The reserve encompasses the Pin Valley National Park and the Kibber and Chandratat Wildlife Sanctuaries.

3. The flagship species of the reserve, the Snow Leopard, is the primary predator regulating the population of the Himalayan Ibex.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (c)

Explanation:

- Statement I is correct. The Cold Desert Biosphere Reserve in Himachal Pradesh became India's 13th site to be included in UNESCO's World Network of Biosphere Reserves (WNBR).
- Statement II is correct. The reserve covers approximately 7,770 sq km and includes high-altitude protected areas such as Pin Valley National Park, Kibber, and Chandratal Wildlife Sanctuaries.
- Statement III is correct. The Snow Leopard is indeed the flagship species and the apex predator of this trans-Himalayan ecosystem, preying on mountain ungulates like the Himalayan Ibex and Blue Sheep. I

3) **With reference to the "Black Tigers" found in Simlipal Tiger Reserve, consider the following statements:**

1. Their distinctive coat pattern is due to a mutation in the Taqpep gene.
2. This condition is termed pseudo-melanism, rather than true melanism.
3. The relatively high occurrence of this trait is linked to genetic isolation and inbreeding within the population.

Which of the statements given above are correct?

- (a) 3 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (d) 1, 2 and 3

Explanation

- Genetic research by the National Centre for Biological Sciences (NCBS) found that the broad black stripes are caused by a missense mutation in the Taqpep gene.
- Statement 2 is correct; it is called "pseudo-melanism" because the black stripes broaden and merge rather than making the entire coat black.
- Statement 3 is correct. Because Simlipal is a small and isolated population (the nearest source is 500 km away), genetic drift and inbreeding have caused this rare mutation to become highly frequent, appearing in nearly 37% of the resident tigers.

4) The Darien Gap is a roadless, dense rainforest that serves as a perilous transit point for migrants between which two countries?

- (a) Mexico and Guatemala
- (b) Thailand and Myanmar
- (c) Brazil and Venezuela
- (d) Colombia and Panama

Answer: (d)

Explanation:

- The Darien Gap is a 60-mile stretch of mountainous rainforest and swampland on the border between Colombia and Panama. It is the only break in the Pan-American Highway, which otherwise runs from Alaska to Argentina.
- Despite its reputation as one of the most inhospitable regions on Earth, it has become a major route for irregular migration toward the United States.

5) With reference to the cultivation of Heeng (Asafoetida) in India, consider the following statements:

1. Heeng is an oleo-gum resin derived from the roots and stem of the plant *Ferula assa-foetida*, and the plant typically takes around five years to mature before resin extraction.
2. The plant thrives in a high-rainfall tropical climate with temperatures above 25°C for optimal resin production.

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: (a) 1 only

Explanation

- Statement 1 is correct; Heeng is an oleo-gum resin obtained primarily from the taproot and stem of the *Ferula* species. It is a perennial plant that requires a gestation period of five years before it can be tapped for resin.
- Statement 2 is incorrect because Heeng is a cold desert crop. It thrives in cold, arid environments with temperatures between 10–20°C and low annual rainfall (200–300 mm). Excessive moisture and heat are detrimental to the plant, which is why it is dormant during the monsoon.

6) With reference to the newly developed rice varieties DRR Dhan 100 (Kamla) and Pusa DST Rice 1, consider the following statements:

1. These are India's first genome-edited rice varieties, developed using Site-Directed Nuclease-1 (SDN-1) technology.
2. Both varieties are treated as Genetically Modified (GM) crops and must obtain mandatory approval from the Genetic Engineering Appraisal Committee (GEAC).

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: (a) 1 only

Explanation

- DRR Dhan 100 (Kamla), developed by the Indian Institute of Rice Research, and Pusa DST Rice 1, developed by the Indian Agricultural Research Institute, are India's first genome-edited rice varieties released for cultivation. They were created using Site-Directed Nuclease-1 (SDN-1) technology, which enables precise edits in the plant's own DNA without inserting foreign genetic material. Therefore, Statement 1 is correct.
- Statement 2 is incorrect. Under India's regulatory framework (2022 guidelines), SDN-1 and SDN-2 genome-edited crops that do not contain transgenes are exempted from the stringent approval process applicable to conventional Genetically Modified (GM) crops. Hence, they do not require

mandatory clearance from the Genetic Engineering Appraisal Committee (GEAC), unlike transgenic crops such as Bt cotton.

7) With reference to Industry 5.0, consider the following statements:

1. It focuses on a human-centric approach, placing the well-being of workers at the core of the production process.
2. It emphasizes resilient supply chains, prioritising stability over short-term efficiency gains.
3. It supports the complete replacement of Artificial Intelligence (AI) with manual human oversight.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (b) Only two

Explanation

- Industry 5.0 represents an advancement over Industry 4.0, incorporating social and environmental considerations into technological development.
- Statement 1 is correct because one of its core principles is human-centricity, where technology is designed to complement and enhance human capabilities rather than replace them.
- Statement 2 is correct as Industry 5.0 promotes resilience in industrial systems. It recognises that highly optimised, just-in-time supply chains can be fragile during global disruptions and therefore encourages more flexible and robust models.
- Statement 3 is incorrect because Industry 5.0 does not seek to eliminate AI. Instead, it promotes collaboration between humans and intelligent machines, such as cobots (collaborative robots), combining human creativity with machine precision. This approach also integrates sustainability, positioning industries as contributors to addressing climate challenges.

8) With reference to the NAKSHA (National Geospatial Knowledge-based Land Survey of Urban Habitations) programme, consider the following statements:

1. It is a pilot initiative implemented by the Department of Land Resources under the Ministry of Rural Development.
2. It employs high-resolution imagery and drone-based surveys to modernise land records in urban areas.
3. The programme is confined to mapping agricultural land in peri-urban regions.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (b) Only two

Explanation

- Statement 1 is correct. The NAKSHA programme is implemented by the Department of Land Resources under the Ministry of Rural Development. It is designed as a pilot project to enhance the accuracy and reliability of urban land records using advanced geospatial technologies.
- Statement 2 is correct. The programme makes use of high-resolution satellite imagery, drone surveys, and modern mapping techniques to create precise and digital land records. Its objective is to improve land governance, reduce disputes, and support efficient urban planning.

- Statement 3 is incorrect. The programme is not restricted to agricultural land in peri-urban areas. Instead, it focuses on urban and semi-urban habitations, covering residential, commercial, and other property parcels to ensure clear ownership and better land management.

9) Match the following terms related to the bio-economy with their correct descriptions:

Term	Description
A. Biofoundry	1. Use of biological materials to produce goods in sectors such as energy and healthcare
B. Biomanufacturing	2. A facility where bioprocesses are automated and optimized for production
C. Synthetic Biology	3. Designing and constructing new biological parts or modifying existing biological systems

Select the correct answer using the code given below:

- (a) A-2, B-1, C-3
- (b) A-1, B-2, C-3
- (c) A-3, B-1, C-2
- (d) A-2, B-3, C-1

Answer: (a) A-2, B-1, C-3

Explanation

- A **Biofoundry** is a specialized facility that integrates automation, robotics, and high-throughput technologies to streamline the design-build-test-learn cycle of biological systems.
- **Biomanufacturing** refers to the application of biological systems such as cells, enzymes, and microorganisms to produce commercially valuable products, including pharmaceuticals, biofuels, and bioplastics.
- **Synthetic Biology** is the underlying scientific discipline that enables the design and engineering of new biological components or the redesign of existing biological systems for specific purposes.
- Together, these concepts are increasingly being used as precision tools for economic growth, technological advancement, and national development. The development of biofoundry networks also aims to strengthen domestic manufacturing capabilities and reduce reliance on imported bio-based technologies.

10) Which one of the following best describes the term “Orange Economy” as used in recent government summits?

- (a) An economy focused exclusively on the export of citrus fruits and agricultural products.
- (b) A strategy to promote the manufacturing of heavy industrial machinery for construction.
- (c) A fiscal model where tax revenues are generated solely from the telecommunications sector.
- (d) A structured engine for economic growth that integrates content, creativity, and culture.

Answer: (d)

Explanation:

- The term “Orange Economy” refers to the creative economy, encompassing industries where imagination, talent, and original ideas are the main drivers of value. This includes music, film, fashion, animation, gaming, and digital content creation.
- The “Orange” designation is used internationally to represent the creative sector, and the Prime Minister declared WAVES 2025 as the dawn of India’s Orange Economy, aiming to make India a global creative hub.

- It is a sector that thrives on human expression rather than factories or machines and is recognized as an engine of inclusive growth and employment, particularly for youth and women. In 2025, India's creative economy contributed around \$30 billion to the GDP.

11) With reference to the procedure for amending the Constitution of India under Article 368 of the Constitution of India, consider the following statements:

1. A Constitutional Amendment Bill can be introduced in either House of Parliament as well as in the State Legislatures.
2. The Bill must be passed in each House by a special majority, i.e., a majority of the total membership and not less than two-thirds of the members present and voting.
3. In case of a disagreement between the two Houses, the President may call a joint sitting to resolve the deadlock.
4. Amendments affecting the representation of States in Parliament require ratification by the legislatures of all the States.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (a) Only one

Explanation

- The procedure for amending the Constitution is governed by Article 368 of the Constitution of India, which establishes a framework that is both rigid and flexible.
- Statement 1 is incorrect because only Parliament has the authority to initiate a Constitutional Amendment Bill. State Legislatures do not have the power to introduce such Bills.
- Statement 2 is correct as it accurately defines the “special majority” required for passing a Constitutional Amendment Bill—namely, a majority of the total membership of the House along with at least two-thirds of the members present and voting.
- Statement 3 is incorrect because the provision of a joint sitting under Article 108 of the Constitution of India does not apply to Constitutional Amendment Bills. Each House must pass the Bill independently.
- Statement 4 is incorrect because amendments affecting federal provisions, such as representation of States in Parliament, require ratification by at least one-half of the State Legislatures, not all. This ensures a balance between federal participation and national decision-making.

12) Consider the following statements regarding the RELIEF Scheme:

1. Statement I: The scheme is designed to reduce financial risks faced by Indian exporters, particularly in the West Asian region.
2. Statement II: ECGC Limited acts as the nodal agency responsible for implementing the scheme by providing a financial buffer against rising freight and insurance costs.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for 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

- Statement I is correct. The RELIEF scheme is a targeted initiative aimed at safeguarding Indian exports from disruptions caused by geopolitical tensions in West Asia. It specifically covers countries such as Egypt, Jordan, UAE, and Iran. The primary objective is to maintain the competitiveness of Indian goods despite increased costs arising from “war-risk” premiums and higher freight charges, especially when key maritime routes face instability.
- Statement II is also correct. ECGC Limited (Export Credit Guarantee Corporation of India) functions as the nodal agency for implementing the scheme. It is responsible for managing risk coverage and facilitating reimbursement of increased logistical costs.
- However, Statement II is not the correct explanation for Statement I. The scheme’s focus on West Asia is driven by the region’s geopolitical volatility and associated maritime risks (such as disruptions near critical sea routes), rather than merely the role played by ECGC Limited in its implementation.

13) With reference to Foot-and-Mouth Disease (FMD), consider the following statements:

1. It is a fatal bacterial infection that primarily affects cloven-hoofed animals.
2. Young animals infected with FMD may experience sudden death due to myocarditis.
3. There are seven distinct serotypes of the virus, and immunity to one ensures protection against all others.
4. Humans can act as mechanical vectors by carrying the virus on their clothes and skin.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (b)

Explanation:

- Foot-and-Mouth Disease is a complex veterinary challenge.
- Statement 1 is incorrect because FMD is a viral disease caused by an aphthovirus (Picornaviridae family), not a bacterial one. Furthermore, it is rarely fatal in adult animals, though it causes massive productivity losses.
- Statement 2 is correct; while adults usually survive, young calves, lambs, and piglets are highly susceptible and often die suddenly from myocarditis (heart muscle inflammation).
- Statement 3 is incorrect due to the nature of the virus’s serotypes (O, A, C, SAT 1, SAT 2, SAT 3, and Asia 1). Immunity is serotype-specific, meaning a vaccine or recovery from serotype ‘O’ does not protect the animal against ‘SAT 1’. This makes global control extremely difficult.
- Statement 4 is correct as humans, vehicles, and farm equipment are major mechanical vectors. The virus is remarkably hardy and can survive on clothing, skin, or tyres, allowing it to spread across borders even without direct animal contact.

14) Which of the following best describes the ‘Blue Line’ in the context of West Asian geopolitics?

- (a) A maritime boundary between Israel and Lebanon in the Mediterranean Sea.
- (b) The natural boundary formed by the Litani River separating northern and southern Lebanon.
- (c) A buffer zone created by the 2026 ceasefire deal extending 10 km into Israel.
- (d) A 120 km border demarcation established by the UN between Israel and Lebanon.

Answer: (d)

Explanation:

- The Blue Line is a critical geopolitical marker in the Levant. It is a 120 km border line published by the United Nations in the year 2000 for the purposes of determining whether Israel had fully withdrawn from Lebanon. It is not a formal international border but acts as a “line of withdrawal.”
- Option (a) is incorrect as the Blue Line is a terrestrial demarcation, although maritime disputes do exist between the two nations. Option (c) is incorrect because the 10 km buffer zone mentioned in the April 2026 ceasefire deal is located inside southern Lebanon, not Israel, and is intended to prevent Hezbollah incursions.
- Option (b) is incorrect; while the Litani River is a strategic landmark and the longest river in Lebanon, it is located entirely within Lebanese territory and does not define the international boundary itself.
- The 2026 ceasefire is historically significant as it represents the first time these two nations, technically in a state of war, have engaged in direct diplomatic talks, moving beyond the mere observation of the Blue Line toward a potential negotiated settlement.

15) With reference to the State of India’s Bats 2024–25 report, consider the following statements:

1. Karnataka and Kerala have the highest bat diversity in India.
2. The Kolar Leaf-nosed Bat is Critically Endangered and confined to a single cave.
3. Bats are the only mammals capable of true, sustained flight.

How many of the above statements are incorrect?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (a) Only one

Explanation:

- Statement 1 is incorrect: Highest diversity is in West Bengal and Meghalaya.
- Statement 2 is correct: Species is critically endangered, found in one cave.
- Statement 3 is correct: Bats are the only mammals with true flight.