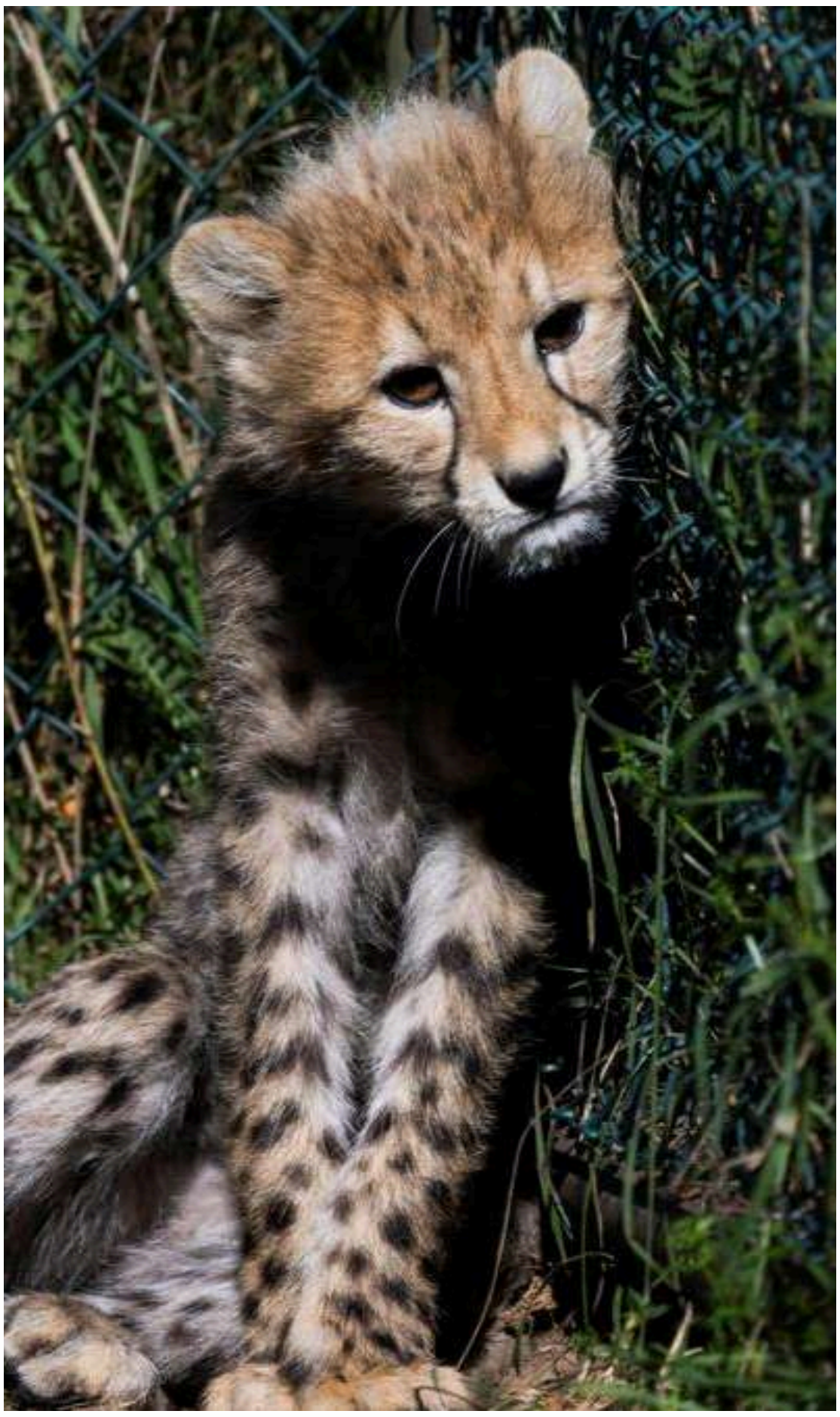
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Editor's Note

Welcome to the latest edition of Pala Civil Times, your guide to understanding the issues, ideas and developments shaping India and the world.

This edition begins on a sombre note with the death of a cheetah cub at Kuno National Park, Madhya Pradesh, after it was reportedly shot and injured. The incident raises concerns about the challenges facing India's cheetah reintroduction project and the need to ensure the long-term survival of the species. We then turn to the national headlines, where the Supreme Court has questioned the Election Commission of India over concerns that discrepancies in the Special Intensive Revision (SIR) of electoral rolls could leave crores of voters at risk of losing their voting rights.

Our science section explores gene editing in rice breeding and its potential to address emerging challenges such as climate change, drought and other agricultural stresses. Meanwhile, our Editorial Decoder examines two important issues: Keralam's new legislation for senior citizens and the challenges posed by Cyclone Arnab.

News headlines offer a window into the issues shaping our society. We hope this edition encourages readers to look beyond the headlines, understand the underlying issues and make meaningful notes that strengthen their preparation.

Happy reading!

P6. SCIENCE



Gene Editing and the Future of Rice and Wheat Production in India

Advances in gene editing offer the potential to develop high-yielding, climate-resilient rice varieties that can withstand drought, salinity and other agricultural stresses.

Editorials Decoded

THE HINDU

The Indian EXPRESS



Hunker down: On Cyclone Arnab, its landfall

Cyclone Arnab's rapid intensification and early landfall highlight the need for accurate forecasting, timely evacuation and better protection of infrastructure, agriculture and livelihoods.



On care for elderly, Keralam sets an example

Keralam's new legislation seeks to strengthen elderly care, protect senior citizens from abuse and neglect, and address the growing challenges of an ageing population.

Supreme Court Questions ECI's Powers in Special Intensive Revision of Electoral Rolls

The Supreme Court has questioned the Election Commission of India's (ECI) approach to deleting existing voters from electoral rolls during the Special Intensive Revision (SIR). The Court expressed concern that failure to return enumeration forms could lead to disenfranchisement and directed the ECI to consider corrective measures.

What are the key concerns raised by the Supreme Court?

Disenfranchisement of existing voters: The Court questioned whether voters could permanently lose their voting rights merely because they failed to return enumeration forms during the SIR.

Improper use of application forms: The ECI was criticised for requiring deleted voters to apply as new voters through Form 6, instead of allowing them to submit enumeration forms belatedly.

Logical discrepancy: The Court questioned the deletion of voters, including those listed in the 2003 electoral roll, on the basis of logical discrepancies.

Delhi SIR concerns: Of the 1,45,10,299 electors in Delhi at the beginning of the revision, 47,56,722 were marked as not having returned enumeration forms due to absence, relocation, death or duplicate entries.

Procedural safeguards: The Court suggested allowing delayed submission of enumeration forms, extending deadlines and publishing physical lists of deleted voters in local languages. It also gave the ECI two weeks to consider corrective measures.

PYQ COMPASS

Q. Right to vote and to be elected in India is a (2017)
(a) Fundamental Right
(b) Natural Right
(c) Constitutional Right
(d) Legal Right

Q. In the light of recent controversy regarding the use of Electronic Voting Machine (EVM), what are the challenges before the Election Commission of India to ensure the trustworthiness of elections in India? (GS II - 2018)

What are the relevant constitutional and legal provisions?

Article 326 — Universal Adult Suffrage: Provides for elections to the Lok Sabha and State Legislative Assemblies on the basis of adult suffrage, subject to constitutional conditions.

Nature of the right to vote: The Supreme Court has generally held that the right to vote is a statutory right, regulated by electoral laws, rather than a Fundamental Right. However, elections must comply with constitutional requirements and applicable laws.

Article 329 — Bar on interference by courts in electoral matters: Article 329(b) provides that elections to Parliament or State Legislatures can be challenged only through an election petition, as prescribed by law.

Judicial review and electoral disputes: The Supreme Court has generally resisted interrupting an ongoing election process, even in cases alleging manifest illegality, to prevent delays and disruptions. However, the applicability of this restriction depends on the nature of the dispute and the stage of the electoral process.

What is the significance of the case?

Democratic participation: Electoral roll revision must not arbitrarily exclude eligible citizens from voting.

Administrative accountability: The ECI must exercise its powers consistently with electoral laws and provide reasonable opportunities to voters to establish their eligibility.

Procedural clarity: The distinction between existing voters and new applicants must be maintained while applying Forms 6, 7 and 8.

Balancing efficiency and inclusion: Electoral roll revision is necessary to maintain accurate voter lists, but administrative convenience and strict deadlines should not unnecessarily deprive eligible citizens of electoral participation.

Project Cheetah: Centre Orders Probe into Cheetah Cub's Shooting Death

The Union Government has constituted a three-member committee to investigate the shooting death of a 19-month-old cheetah cub outside Kuno National Park (KNP), Madhya Pradesh. The incident, the first reported killing of a cheetah since the launch of Project Cheetah in September 2022, has raised concerns about wildlife protection, security protocols and the long-term success of India's cheetah reintroduction programme.

What happened in Kuno National Park?

Incident: Cheetah cub KGN22, offspring of female cheetah Nirva, was found critically injured on October 25, 2026, in the Sheopur Territorial Forest Division, outside Kuno National Park.

Cause of death: Five firearm pellets were recovered from the cub's body, including its internal organs. Despite surgery and treatment, the cub died on October 27, 2026.

Central investigation: The Ministry of Environment, Forest and Climate Change (MoEFCC) constituted a three-member team comprising officials from the National Tiger Conservation Authority (NTCA) and the Wildlife Crime Control Bureau (WCCB).

State-level action: Madhya Pradesh has formed a four-member Special Task Force (STF) comprising police and forest officials. The State Tiger Strike Force is also deployed.

What is Project Cheetah, and why is it significant?

Background: The Asiatic cheetah historically ranged across much of India, from Punjab to Tamil Nadu and from Gujarat and Rajasthan to Bengal. Hunting, poaching, habitat loss and declining prey populations contributed to its extinction in India.

Extinction in India: The last confirmed wild cheetahs were reportedly shot in 1947 in present-day Chhattisgarh. The species was officially declared extinct in India in 1952.

Reintroduction: India launched Project Cheetah in September 2022, bringing cheetahs from African populations, including Namibia and South Africa, to re-establish the species within its historical range.

Kuno National Park: Selected as the primary reintroduction site following the voluntary relocation of 24 villages involving 1,545 families, which created nearly 6,258 hectares of inviolate grassland.

What are the ecological objectives of Project Cheetah?

Ecosystem restoration: Cheetahs are designated as a flagship and umbrella species. Their reintroduction is intended to support the restoration of grasslands, open forests and semi-arid ecosystems.

Biodiversity conservation: Improved habitat management can benefit prey species and other threatened grassland-dependent wildlife.

Global conservation: The project contributes to international efforts to conserve cheetahs and re-establish populations within their historical range.

Community livelihoods: Wildlife conservation and associated ecotourism may improve livelihood opportunities and strengthen local economies.

Sustainable development: The initiative supports the objectives of the Convention on Biological Diversity (CBD) and United Nations Sustainable Development Goal 15, which focuses on Life on Land.

PYQ COMPASS

Q. Consider the following statements: (2024)

1. Lions do not have a particular breeding season.
2. Unlike most other big cats, cheetahs do not roar.
3. Unlike male lions, male leopards do not proclaim their territory by scent marking.

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

Hunker down: On Cyclone Arnab, its landfall

Cyclone Arnab, the first named storm of the North Indian Ocean cyclone season in 2026, made landfall on October 28 as a very severe cyclonic storm. Its rapid intensification and earlier-than-forecast landfall exposed challenges in weather prediction and evacuation planning. Although disaster management operations helped reduce casualties, the storm highlighted the need to minimise disruptions and protect livelihoods alongside saving lives.

What were the major impacts of Cyclone Arnab?

Rapid intensification: The cyclone strengthened quickly, and some forecasting models failed to anticipate its eventual intensity. It also approached the coast faster than expected, reducing the time available for evacuation.

Wind and rainfall: With core wind speeds of 125–135 km/h, it brought more than 100 mm of rain to parts of Andhra Pradesh, including Anakapalli, Visakhapatnam, Kalingapatnam, Kakinada and Machilipatnam.

Human and infrastructure losses: Andhra Pradesh reported five deaths, despite extensive precautionary measures.

Continuing threat to Odisha: Moisture from the cyclone's outer circulation threatened southern Odisha with further rainfall, even after the system completed landfall.

PYQ COMPASS

Q. Consider the following statements: (2020)
1. Jet streams occur in the Northern Hemisphere only.
2. Only some cyclones develop an eye.
3. The temperature inside the eye of a cyclone is nearly 10ºC less than that of the surroundings.
Which of the statements given above is/are correct?
a) 1 only
b) 2 and 3 only
c) 2 only
d) 1 and 3 only

Q.What is disaster resilience? How is it determined? Describe various elements of a resilience framework. Also mention the global targets of the Sendai Framework for Disaster Risk Reduction (2015-2030). (GS III - 2024)

Why is Odisha particularly vulnerable to further rainfall?

Saturated soil: Odisha had experienced its fourth-wettest monsoon on record. In areas that had already experienced flooding, additional rainfall could trigger renewed inundation even at lower rainfall levels.

Agricultural losses: Farmers in Ganjam and Puri feared prolonged inundation of paddy fields. Ganjam had already lost 33% of its crops by October, compounding the effects of the southwest monsoon.

Uneven agricultural impact: While excessive rainfall threatens crops in some districts, farmers in Sundargarh hoped the cyclone would relieve moisture stress after a dry month.

Weather alerts: The India Meteorological Department (IMD) issued alerts for Ganjam, Gajapati, Rayagada, Koraput, Malkangiri, Nabarangpur and Kalahandi.

What are the key lessons for disaster management?

I**mprove forecasting:** Rapid intensification and changes in the speed of cyclones require better forecasting models, continuous monitoring and timely communication of updated warnings.

Strengthen evacuation preparedness: Authorities must account for the possibility of landfall occurring earlier than predicted, particularly in high-risk coastal settlements.

Adopt a zero-disruption approach: Disaster management should aim not only to prevent deaths but also to minimise damage to infrastructure, essential services and livelihoods.

Build agricultural resilience: Better drainage, flood-resistant agricultural practices, crop-loss assessment and timely relief can reduce the financial burden on farmers.

Integrate disaster recovery: Post-cyclone assessments should address damaged infrastructure, disrupted transport, power supply and the risk of households falling into poverty.

On care for elderly, Keralam sets an example

The Keralam Legislative Assembly has taken a significant step towards strengthening elderly care by passing the Keralam Senior Citizens (Care and Protection of Rights) Bill, 2026. The legislation seeks to move beyond family-dependent care and welfare-based support towards a rights-based framework that promotes dignity, independence, safety and social participation. Its importance lies in Keralam's rapidly ageing population and the declining capacity of traditional family structures to provide long-term care.

What explains the recent workforce reductions?

Rapid demographic transition: The share of people aged 60 and above increased from 12.7% in 2011 to 15% in 2021. It is projected to reach 30% by 2051, with the elderly population expected to outnumber children by 2030.

Changing family structures: Smaller families, migration and changing social arrangements are weakening traditional support systems, increasing the need for professional and community-based care.

Inadequate care infrastructure: A NITI Aayog report highlighted the shortage of specialised elderly-care facilities, particularly in rural areas where many senior citizens live.

Policy continuity: Keralam introduced an elderly-care policy in 2006, revised it in 2013 and released a draft State Policy for Elder Persons in August 2025. It also enacted the Kerala State Senior Citizens Commission Act, 2025.

Key takeaway: *The Keralam Senior Citizens Bill, 2026, seeks to make elderly care a matter of rights, dignity and independent living rather than dependence on family support alone. Its success will depend on effective implementation, accessible geriatric healthcare, professional caregiving and sustainable financing. With India's population ageing rapidly, Keralam's experience could offer valuable lessons for national elderly-care policy.*

PYQ COMPASS

Q. The increase in life expectancy in the country has led to newer health challenges in the community. What are those challenges and what steps need to be taken to meet them? (GS III - 2022)

What are the key provisions of the Bill?

Ageing in place: Recognises the right of senior citizens to live safely and independently in their own homes or chosen communities, with institutional care treated as a last resort. Families and legal heirs are expected to provide necessary care.

Living wills: Allows senior citizens to record preferences regarding medical interventions, including intensive care and life-sustaining treatment, should they become unable to communicate their wishes.

Access to care and services: Seeks to make home care, day care, assisted living, hospice care and emergency medical assistance affordable, accessible and non-discriminatory.

Senior-friendly public spaces: Promotes accessible washrooms, ramps, priority seating and queues, alongside opportunities for recreation and participation in social, cultural and spiritual activities.

Protection against abuse and cyber fraud: Covers physical, emotional, psychological, sexual and economic abuse, exploitation of property and identity, online financial fraud, identity theft and deception using artificial intelligence-generated content.

Regulation of care centres: Makes registration mandatory for elderly-care centres and related facilities. It prescribes standards for resident safety, recreation and protection from abuse.

Professionalisation of caregiving: Requires caregiver registration, graded certification, background verification and refresher training every three years. Police clearance is mandatory for specified caregiving roles. The Bill also recognises caregivers' rights to fair pay, safe working conditions and social security.

Gene Editing and the Future of Rice and Wheat Production in India

India's food security depends heavily on rice and wheat, which occupy more than half of its farmland and provide most of the calories consumed by its population. Climate change, extreme weather, water scarcity and the need to reduce excessive fertiliser and pesticide use have increased the demand for climate-resilient, high-yielding crop varieties. Advances in gene editing and fundamental plant research offer India an opportunity to improve agricultural productivity while strengthening sustainable farming.

Key takeaway: *India took a big step forward in 2025 in using gene-editing technology to improve rice, and became the first country to allow farmers to grow rice that had been edited using this technology.*

How is gene editing transforming rice cultivation in India?

Public-sector leadership: The National Seeds Corporation (NSC), established in 1963, works with State seed corporations and agricultural universities. The Indian Council of Agricultural Research (ICAR) and State agricultural universities develop breeder seeds, which are multiplied and distributed through public and private partners.

Gene-edited rice varieties: In 2025, India became the first country to permit the cultivation of rice varieties developed using gene-editing. Two varieties, DRR Dhan 100 and Pusa DST Rice 1, were developed using Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) technology.

DRR Dhan 100: This variety matures in approximately 130 days, compared with 150 days for the baseline strain. It produces nearly 20% higher yields, at about 5.4 tonnes per hectare, while reducing water requirements and labour costs.

Pusa DST Rice 1: Developed for saline and alkaline soils, it produces approximately 10–30% higher yields than baseline strains under these conditions. It also demonstrates improved tolerance to salt stress.

Precision breeding: CRISPR enables targeted changes to existing genes without necessarily introducing foreign genes. In these rice varieties, the editing tools were not detected in the final strains, making the resulting changes comparable to those brought by conventional mutation and breeding, but faster and more precisely.

What scientific advances make these varieties significant?

Understanding plant physiology: Research on cytokinin, a plant hormone involved in spikelet formation, helped scientists modify grain production in rice. The DRR Dhan line partially reduces the activity of an enzyme that degrades this hormone, allowing more spikelets and grains to develop without the growth problems associated with completely disabling the gene.

Building on earlier discoveries: In 2005, Japanese researcher Motoyuki Ashikari's team linked a natural deletion in the corresponding gene to increased grain numbers. Indian researchers recreated the beneficial effect through targeted gene editing.

Improving stress tolerance: Research at ICAR–Indian Agricultural Research Institute used CRISPR-Cas9 to modify the OsDST gene, producing rice plants with broader leaves, fewer stomata and improved survival under salt stress. Survival exceeded 65%, compared with approximately 20% in unedited plants. This research laid the foundation for Pusa DST Rice 1.

Preserving public access: Public institutions developed these varieties, and the associated seeds are not intended to be restricted by restrictive patents or licensing arrangements. The technology is also designed to remain accessible to public breeding programmes.

PYQ COMPASS

What is apomixis, and how could it benefit farmers?

Concept: Apomixis enables plants to reproduce asexually through seeds, bypassing normal sexual reproduction and fertilisation. It can preserve the desirable characteristics and hybrid vigour of a parent plant across generations.

Scientific progress: Venkatesan Sundaresan and Imtiyaz Khanday demonstrated apomixis in rice in 2018. Its efficiency has since improved, with reported success rates reaching approximately 90% in rice.

Benefits for farmers: Farmers could save and replant seeds from high-yielding crops without losing their desirable traits. This could reduce recurring seed costs, particularly for smallholders.

Implementation challenges: Large-scale adoption requires field testing across different environments, regulatory approval and systems for producing sufficient quantities of seed.

How are other countries advancing wheat research?

India: Gene-edited wheat has not yet been released. However, new conventional varieties, including climate-resilient wheat lines, are being developed.

Argentina and the United States: The HB4 wheat trait, developed by Bioceres Crop Solutions using a sunflower gene, improves drought tolerance. It is commercially cultivated in Argentina and, on a smaller scale, in Brazil and Paraguay. The United States approved its cultivation in August 2024, although large-scale planting requires further trials, integration into local varieties and export-market acceptance.

Australia: Field trials of HB4 wheat began in 2024. The University of Adelaide is also researching genetically modified wheat and barley for higher yields, while InterGrain and Inari are testing CRISPR-edited wheat with the aim of increasing yields by 10%.

International collaboration: Australian Grain Technologies and China's Qihe Biosciences have announced collaboration on cross-border field trials of a CRISPR-edited wheat variety, illustrating the growing role of international research partnerships.

What scientific advances make these varieties significant?

Understanding plant physiology: Research on cytokinin, a plant hormone involved in spikelet formation, helped scientists modify grain production in rice. The DRR Dhan line partially reduces the activity of an enzyme that degrades this hormone, allowing more spikelets and grains to develop without the growth problems associated with completely disabling the gene.

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PYQ COMPASS

Q. Which of the following statements is/are correct regarding the vegetative propagation of plants? (2014)
1. Vegetative propagation produces a clonal population.
2. Vegetative propagation helps in eliminating the virus.
3. Vegetative propagation can be practiced most of the year.
Select the correct answer using the code given below:
a) 1 only
b) 2 and 3 only
c) 1 and 3 only
d) 1, 2 and 3

PYQ COMPASS

Q. Right to vote and to be elected in India is a (2017)
(a) Fundamental Right
(b) Natural Right
(c) Constitutional Right
(d) Legal Right

Ans : C
The right to vote and to be elected in India is a Constitutional Right. It is governed by Article 326 of the Constitution, which provides that elections to the House of the People and the Legislative Assemblies of States shall be based on adult suffrage. While it is not a Fundamental Right, it is essential for the democratic process.

Q. Consider the following statements: (2024)
1. Lions do not have a particular breeding season.
2. Unlike most other big cats, cheetahs do not roar.
3. Unlike male lions, male leopards do not proclaim their territory by scent marking.
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

Ans : a
Lions do not have a particular breeding season: This statement is correct. Unlike some other species of big cats, lions can breed throughout the year, and there is no specific breeding season.
Unlike most other big cats, cheetahs do not roar : This statement is correct. Cheetahs do not have the ability to roar like other big cats (lions, tigers, leopards, etc.). Instead, they make other vocalizations such as purrs, chirps, and hisses. **Unlike male lions, male leopards do not proclaim their territory by scent marking: This statement is incorrect.** Male leopards, like other big cats, do indeed scent-mark their territory. They use urine, feces, and glandular secretions to mark their territory and communicate with other leopards. Thus, statements 1 and 2 are correct, but statement 3 is incorrect.
Hence, the correct answer is a) 1 and 2 only.

PYQ COMPASS

Q. Consider the following statements: (2020)
1. Jet streams occur in the Northern Hemisphere only.
2. Only some cyclones develop an eye.
3. The temperature inside the eye of a cyclone is nearly 10°C less than that of the surroundings.
Which of the statements given above is/are correct?
a) 1 only
b) 2 and 3 only
c) 2 only
d) 1 and 3 only

Ans : C
Jet streams occur in the Northern Hemisphere only: This statement is incorrect. Jet streams are fast flowing, narrow air currents that occur in both the Northern and Southern Hemispheres.
Only some cyclones develop an eye: This statement is correct. Only well-developed tropical cyclones have a distinct eye, which forms due to the intense central low-pressure system.
The temperature inside the eye of a cyclone is nearly 10°C less than that of the surroundings: This statement is incorrect. The eye of a cyclone is relatively warm compared to the surrounding areas due to descending air.
Thus, only statement 2 is correct, making the answer c) 2 only.

Q. Which of the following statements is/are correct regarding the vegetative propagation of plants? (2014)
1. Vegetative propagation produces a clonal population.
2. Vegetative propagation helps in eliminating the virus.
3. Vegetative propagation can be practiced most of the year.
Select the correct answer using the code given below:
a) 1 only
b) 2 and 3 only
c) 1 and 3 only
d) 1, 2 and 3

Ans : C
Statement 1: Correct. Vegetative propagation produces genetically identical offspring (a clonal population) since no genetic recombination occurs.
Statement 2: Incorrect. Vegetative propagation does not eliminate viruses; in fact, viruses often persist in vegetative tissues.
Statement 3: Correct. Since vegetative propagation does not depend on flowering or seed production, it can often be practiced throughout the year.

PRACTICE QUESTIONS

Q. Consider the following statements regarding the challenges associated with agricultural biotechnology in India:

1. Climate-resilient crop varieties must improve productivity while reducing dependence on water, fertilisers and pesticides.
2. Negative public perceptions of genetically modified organisms (GMOs) may discourage students from pursuing fundamental research in plant sciences.
3. Strengthening private-sector participation necessarily requires public research institutions to relinquish their role in developing and distributing improved crop varieties.
4. Successful agricultural innovation requires effective coordination between scientific research, regulatory processes, seed distribution and farmers' needs.

Which of the statements given above are correct?
A) 1 and 2 only
B) 1, 2 and 4 only
C) 2, 3 and 4 only
D) 1, 2, 3 and 4

Answer: B) 1, 2 and 4 only

- Statement 1 is correct: Agricultural research must improve yields while promoting sustainable resource use and resilience to droughts and floods.
- Statement 2 is correct: Negative perceptions of GMOs can discourage aspiring researchers from entering plant sciences, weakening fundamental research.
- Statement 3 is incorrect: Private-sector participation does not require public institutions to relinquish their role. Public research remains important for affordable and accessible agricultural technologies.
- Statement 4 is correct: Scientific advances must be supported by field trials, regulatory evaluation, seed multiplication and distribution, and policies responsive to farmers' needs.

Q. With reference to Kuno National Park, which of the following statements is/are correct?

1. It is located in the Sheopur district of Madhya Pradesh.
2. It was selected as the first site for cheetah reintroduction in India under Project Cheetah.
3. The cheetahs introduced into the park were sourced exclusively from African countries other than Namibia and South Africa.

Select the answer using the code given below:
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: (a) 1 and 2 only
Statement 1 is correct. Kuno National Park is located in Madhya Pradesh.
Statement 2 is correct. Kuno was developed as India's first cheetah reintroduction site under Project Cheetah, launched in September 2022.
Statement 3 is incorrect. The initial cheetah populations were brought from Namibia and South Africa. Botswana also contributed cheetahs in 2026.