NEXT IAS

SUMMARY OF

DOWN TO EARTH

[16–30 JUNE, 2025]

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[16–30 June, 2025]

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THREE DECADES OF PANCHAYATI RAJ INSTITUTIONS (PRI)

Context

- Even three decades after panchayats received constitutional status, states across India seem unwilling to share power with them.

Constitutional Framework of PRI

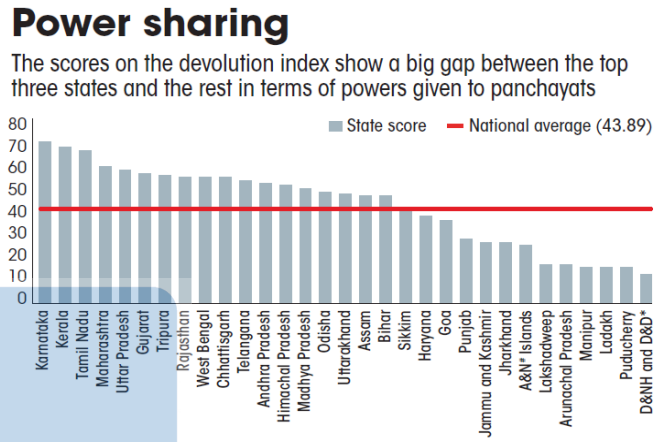
- The **73rd Amendment**, enacted in 1992 and operational from 1993, mandated the creation of a **three-tier PRI system — Gram Panchayat, Panchayat Samiti, and Zila Parishad**.
- It provided for regular elections, reservation for women and marginalized groups, and the **establishment of State Finance Commissions** to ensure fiscal devolution.

Achievements on the Ground

- Over 2.5 lakh Gram Panchayats now play a role in implementing flagship schemes, from sanitation to housing.
- **SVAMITVA Scheme** to provide property rights via drone mapping;
- **Rashtriya Gram Swaraj Abhiyan** for capacity building
- The **Localization of SDGs (LSDGs)** through thematic **Gram Panchayat Development Plans (GPDPs)**.

Status of Devolution to Panchayats in States

- It assesses **states on six dimensions** — *framework, functions, finance, functionaries, capacity enhancement and accountability.*
- States have devolved power to panchayats, but **only 43.9% of the target has been met**, up from 39.9% in 2013-14.
- **Karnataka** tops the overall Devolution Index ranking, while **Kerala and Tamil Nadu** are in the second and third spot, respectively.



Persisting Gaps

- **Incomplete Devolution of Powers:** Most Indian states have failed to devolve all 29 subjects listed in the **Eleventh Schedule of Constitution**.
- **Fiscal Dependence and Shrinking Autonomy:** While direct transfers to Panchayats have increased — from ₹1.45 lakh crore under the 13th FC to ₹2.36 lakh crore under the 15th — untied grants have **declined from 85% to 60%.**
- **Administrative Weakness and Staff Shortages:** Many Gram Panchayats lack dedicated staff such as secretaries, engineers, and data entry operators.
    - The absence of trained personnel also weakens transparency and accountability mechanisms like social audits and Gram Sabha oversight.

- **Declining Public Participation:** The Gram Sabha, envisioned as the cornerstone of participatory democracy, often functions perfunctorily.
    - Low attendance, lack of awareness, and tokenistic consultations have diluted its role in decision-making.
- **Politicization and Bureaucratic Interference:** PRIs are increasingly seen as extensions of state governments or political parties rather than autonomous institutions.
    - Excessive bureaucratic control and political patronage have eroded their independence, with elected representatives often sidelined in favor of administrative diktats.

Road Ahead

- Strengthening institutional capacity through training and digital tools.
- Ensuring fiscal autonomy with timely and adequate fund transfers.
- Empowering Gram Sabhas to become vibrant forums for local democracy.
- Integrating climate resilience and disaster preparedness into local planning.

FOOD CROPS & ETHANOL-BLENDING PROGRAMME IN INDIA

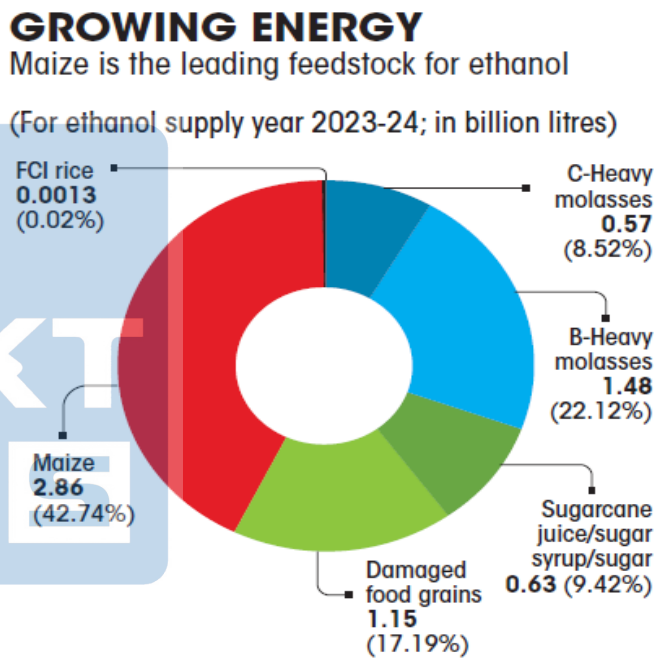
Context

- India's dependence on major food crops for its ethanol-blending programme can have spiralling impacts on food inflation, nutrition availability.

About

- India's ambitious **Ethanol Blended Petrol (EBP) Programme** is reshaping the country's energy and agricultural landscape.
- It promises to reduce fossil fuel imports, cut carbon emissions, and boost rural incomes, with a **target of 20% ethanol blending** by 2025.

Ethanol and Its Agricultural Roots



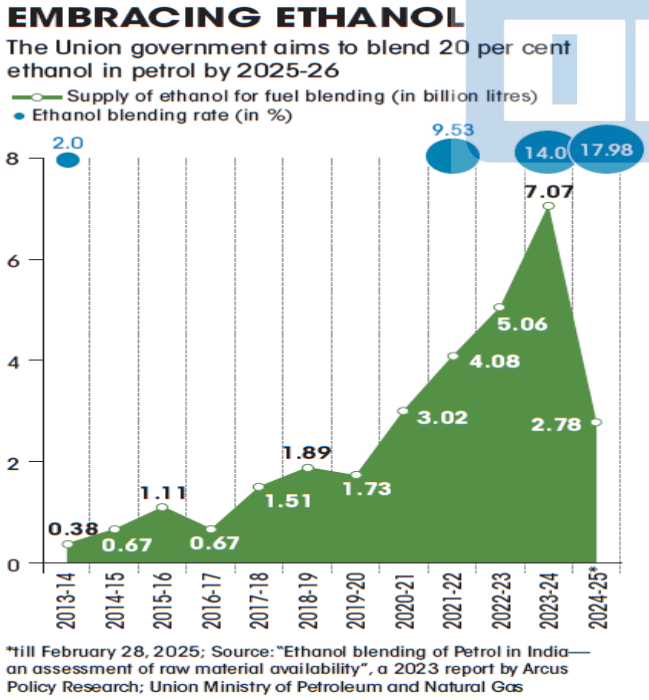
Source: Union Ministry of Consumer Affairs, Food and Public Distribution

- Ethanol in India is primarily produced from **sugarcane-based feedstocks like C and B-heavy molasses**, sugarcane juice, and surplus sugar.
- In recent years, the government has also allowed the **use of surplus rice from the FCI** and **maize** to diversify supply sources.
- According to a **NITI Aayog report,** sugar remains the most lucrative crop for ethanol production, despite its high water footprint.

- Maize, while less water-intensive, has a lower ethanol yield, making it a less attractive option for distillers.
- As per **UN's 'State of Food Security and Nutrition in the World'** report in 2024, **over 55% people** in the country are unable to afford a healthy diet.

Evolution of Ethanol Policies in India

- **2003 (Ethanol Blending Programme):** It mandates 5% blending of petrol in 9 states, 4 Union Territories (UTs)
  - **2004:** The mandate is made optional due to supply shortage.
  - **2006:** The mandate resumes, with the government directing public sector oil marketing companies to sell 5% ethanol blended petrol in 20 states, 4 UTs.



- **2007:** 5% ethanol blending of petrol becomes mandatory across the country except in Jammu & Kashmir, the Northeast and island territories
- **2008 (First National Policy on Biofuels)**: It sets a target of 20% blending by 2017.
- **2018 (Second National Policy on Biofuels):** It mandates 10% blending by 2021-22 and 20% by 2030;
  - It expands feedstock for ethanol production, from C-heavy molasses, to B-heavy molasses, sugarcane juice, and grains.
- **2022:** 20% ethanol blending target advanced from 2030 to 2025-26.
- **2023:** Government halts rice procurement and caps diversion of sugar for ethanol production
- **2024 (Modified Pradhan Mantri JI-VAN Yojana):** It was launched to include **advanced (2nd generation) biofuels** from lignocellulosic feedstocks, such as **agricultural and forestry residues, algae;** government allows procurement of rice and lifts cap on sugar diversion for ethanol production.
- **2025:** Government approves **additional 2.8 million tonnes of rice** with FCI for ethanol, raising total allocation to 5.2 million tonnes.

MAMMOTH IN THE PATENT SYSTEM: DE-EXTINCTION, PROFIT, AND THE LEGAL FRONTIER

Context

- As biotechnology firms **race to bring back extinct species** through de-extinction, a new frontier is emerging — not just in science, but in intellectual property law.

From Fossils to Patents

- De-extinction involves **using gene-editing** tools like **CRISPR to insert ancient DNA** into the genome of a closely related living species.
- In the case of the woolly mammoth, scientists are **modifying Asian elephant DNA** to create a cold-resistant hybrid that resembles its prehistoric ancestor.
- Companies like **Colossal Biosciences** are investing heavily in this space.
    - Its core strategy: aggressive patenting.

Science Behind De-Extinction

- **De-extinction** refers to the use of genetic engineering tools — **primarily CRISPR** — and reproductive technologies to bring back long-extinct species.
- Scientists start with DNA from ancient bones or preserved museum specimens, then splice key genes into the genome of a closely related living species.
- In the case of the woolly mammoth, the candidate surrogate is the Asian elephant.

Legal Grey Zone

- The U.S. patent system allows for patents on non-naturally occurring, man-made organisms, a precedent set in 1980.
- However, the idea of patenting a revived extinct species—especially one intended for release into the wild—pushes the boundaries of existing law.

Patent Problem: Who Owns the Past?

- Colossal's patent applications go beyond methods or tools. They aim to secure rights to any genetically altered animals with woolly mammoth traits — hair type, body size, metabolic functions, and more.
- It mirrors historical cases where patents were granted on lab animals like the *OncoMouse* or genetically modified pigs.

ANTARCTIC ICE SHEET

Context

- According to a recent study published in **Communications Earth and Environment**, the **West Antarctic ice sheet** is exhibiting 'hysteresis' behavior, suggesting that its **melting has become irreversible**, regardless of whether global warming is contained.

Antarctic Ice Sheet

- It is the **largest single mass of ice** on Earth, covering **nearly 14 million square kilometers** and holding **about 60% of the planet's fresh water.**
- Antarctica is **divided into East Antarctica**, which is more stable, and **West Antarctica,** which is more dynamic and susceptible to rapid change.
    - The **Transantarctic Mountains** separate these two regions.
- It plays a critical role in regulating global sea levels and climate systems.

Key Study Insights

- The **West Antarctic Ice Sheet** is particularly **vulnerable due to warm ocean currents** that erode it from below.
    - The study found that even a 0.25°C rise in ocean temperatures could eventually lead to a 4-meter rise in sea levels.
- According to **NASA's GRACE satellite data**, Antarctica has been **losing ice** at an average **rate of 150 billion metric tons per year** since 2002.

- It contributes approximately 0.4 millimeters per year to global sea level rise.

Hysteresis Behaviour of Antarctic Ice Sheet

- 'Hysteresis' refers to a system's dependence on its past states.
- For the Antarctic Ice Sheet, it means that once a certain threshold of warming is crossed, the ice continues to melt even if temperatures return to previous levels.
- It is driven primarily by ocean warming, which destabilizes ice shelves from below.
- Once the tipping point is crossed, restoring the ice sheet would require millennia of temperatures below **pre-industrial levels**.

JANJEHLI VALLEY

Context

- Apple orchards, covered in anti-hail nets, in **Janjehli valley of Himachal Pradesh,** have experienced multiple incidents of rain and hailstorms, causing damage to horticultural crops.

About Janjehli Valley

- It is located in the **Mandi district of Himachal Pradesh** at an altitude of 2,150 meters.
- It serves as a base for several treks, including routes to Shikari Devi Temple, Kamru Nag Lake, and Karsog Valley.
- The Himachal Pradesh government has recognized its potential and is developing it under initiatives like **Nai Raahein Nai Manzilein** to boost sustainable tourism and local employment.
- An **Eco-Village Development Plan (EVDP)** has also been formulated for **Janjehli-I (Baila)**, focusing on community participation and sustainable practices to preserve the valley's ecological and cultural heritage.

Tal Chhapar Wildlife Sanctuary

About Tal Chhapar Wildlife Sanctuary

- It is located on the fringes of the Great Indian Desert, in Churu, Rajasthan.
- It is home to species like blackbuck, chinkara, desert fox and migratory birds.

Key Features:

- **Blackbuck Conservation:** The sanctuary is famous for its thriving population of blackbucks, one of India's most elegant antelopes.
  - It has been the subject of various biodiversity studies, including research on faunal diversity and habitat suitability for species like the **Chinkara**
- **Birds:** With over 300 species of birds, including harriers, falcons, buzzards, and vultures, it is a hotspot for ornithologists.
- **Grassland Ecosystem:** Tal Chhapar is a semi-arid grassland, offering a unique landscape for wildlife, unlike dense forests.

AVIAN INFLUENZA (*AKA* BIRD FLU, H5N1)

Context

- Recently, countries, including **India, China, South Africa and the EU**, announced a **complete ban on poultry products from Brazil** by the end of May, after the Latin American country confirmed an **outbreak of avian influenza**.

About the Bird flu (aka Avian Influenza, H5N1)

- It is a highly **contagious viral infection** that primarily affects birds but has also been **known to infect humans and other mammals.**

How H5N1 Spreads

- **Transmission Among Birds:** H5N1 spreads through direct contact with infected birds, contaminated surfaces, or bird droppings.
  - Wild birds, especially migratory species, play a key role in spreading the virus across regions.
- **Human Infections:** While human cases are rare, infections occur through close contact with infected birds or contaminated environments.
  - The virus does not easily spread from human to human, but mutations could increase its transmissibility.

Symptoms and Health Risks

Symptoms in Humans:

- Fever, cough, sore throat, and difficulty breathing.
- Severe cases may lead to pneumonia, respiratory failure, and multi-organ damage.

- **Mortality Rate:**
  - H5N1 has a high fatality rate, with over 50% of reported human cases resulting in death.
  - Early detection and antiviral treatment improve survival chances.
- **Vaccination and Treatment:**
  - While vaccines for poultry exist, human vaccines are still in development.
  - Antiviral drugs like ***Oseltamivir (Tamiflu)*** help reduce severity in infected individuals.

MERCOSUR BLOC *(AKA* SOUTHERN COMMON MARKET)

Context

- Farmers across the European Union are voicing growing concern over Mercosur bloc and Ukraine for influx of cheap agricultural imports.

About Mercosur Bloc

- It is a **regional trade alliance** founded **in 1991** by Argentina, Brazil, Paraguay, and Uruguay, with Bolivia later joining as a full member.
- It has its **own regional standards organization**, headquartered in **São Paulo,** Brazil.
- Its primary goal is to promote free trade and the ease movement of goods, people, and currency among member states.
  - It has negotiated **several free trade agreements (FTAs)**, including one with the European Union, though it has not yet been ratified by all EU member states.
  - It has also signed FTAs with countries like Israel, Chile, and Bolivia.
- It harmonizes technical standards across member countries, which need to ratify them individually before implementation.

CLEAN ENERGY INVESTMENTS

Context

- According to **Environmental Entrepreneurs (E2)**, more than $14 billion in clean energy investments and over 10,000 new jobs were cancelled or delayed.

About the Clean Energy Technologies

- These are reshaping the global energy economy, driven by the rapid adoption of solar photovoltaics (PV), wind power, electric vehicles (EVs), and battery storage.
- According to the International Energy Agency's (IEA), the **market for clean energy technologies** is projected to **exceed $2 trillion by 2035,** nearly quadrupling since 2015.
    - Annual clean energy investment must rise even further—toward **$3.5 trillion per year by 2050,** to meet global climate targets.
- In 2023 alone, the market size for these technologies hit $700 billion, with solar PV and battery manufacturing accounting for 80% of the investment.

Who's Leading the Charge?

- **China** dominates the clean energy manufacturing space, **responsible for 40–98% of global capacity** across key technologies.
- However, the United States and the European Union are ramping up efforts to compete, spurred by industrial policy and energy security concerns.

Investment Drivers

- **Cost competitiveness:** Clean technologies are increasingly cheaper than fossil fuel alternatives.
- **Energy security:** Countries are reducing reliance on imported oil and gas.
- **Industrial strategy:** Nations are vying for leadership in emerging green tech markets.

INGA 3 DEVELOPMENT PROGRAM IN DR CONGO

Context

- Recently, the **World Bank** has approved $250 million in financing for a hydropower project in the DR Congo.

About Inga Hydropower Project

- It is located on the **Congo River**, and has a **potential capacity of 42,000 megawatts** (MW).
- The **Inga site,** situated **between Kinshasa and the Atlantic Ocean**, benefits from a **natural 97-meter drop** and the Congo's immense water volume—the second largest in the world.
- The **first two dams**, **Inga 1 (1972) and Inga 2 (1982)**, together generate about 1,775 MW, though **they operate below capacity** due to maintenance issues.

Inga 3 HEP

- It aims to generate **between 3,000 and 11,000 MW,** depending on its final design.
- It aims to **uplift millions out of poverty** and raise **electricity access** from **21% to 62% by 2030**.

ANTIMICROBIAL RESISTANCE (AMR)

Context

- Recently, the **World Organisation for Animal Health (WOAH)** reported that **Antimicrobial Resistance (AMR)** could cost **$100 trillion by 2050** if urgent action is not taken.

About the Antimicrobial Resistance (AMR)

- AMR occurs when bacteria, viruses, and other pathogens evolve to resist the drugs designed to kill them.
  - It is deeply embedded in the food production chain.
- Antibiotics are widely used in livestock to prevent disease and promote growth, especially in poultry, aquaculture, and cattle farming.
- The **World Bank** warns that AMR could reduce global livestock production by 7.5% annually, disrupt trade, and increase healthcare costs by $1 trillion.
- The use of **last-resort antibiotics** like **Polymyxin and Carbapenems** has surged, raising alarms about the dwindling arsenal of effective treatments.
- The **National AMR Hub**, established by the **Indian Council of Medical Research**, is working to monitor and contain this threat, but challenges remain in enforcement and awareness.

Food Security at Risk

- Resistant infections in animals can lead to higher mortality rates, reduced productivity, and increased costs for farmers.
- It can drive up food prices, reduce availability, and strain already fragile supply chains — especially in low- and middle-income countries.
- The report warns that AMR could jeopardize the food security of **up to two billion people by 2050**.
- In particular, the **use of fluoroquinolones** in aquaculture and the continued use of antimicrobials as growth promoters—including drugs critical to human health like colistin—are raising red flags.

MSC ELSA 3

Context

- Recently, the **Union Ministry of Defence** has confirmed the sinking of the **Liberian-flagged container** vessel **MSC ELSA 3** off the coast of **Kochi, Kerala.**

About the MSC ELSA 3

- It is **184-meter-long vessel**, en route **from Vizhinjam to Kochi**, was carrying 640 containers, including 13 with hazardous cargo and 12 containing calcium carbide, along with over 450 metric tonnes of fuel.
- A coordinated rescue operation **by the Indian Coast Guard (ICG)** and the **Indian Navy** successfully evacuated all 24 foreign crew members, including nationals from **Russia, Ukraine, Georgia, and the Philippines.**
- **It raises** concerns about **plastic debris** from the wreck washed ashore on **Chothavilai beach in Kanyakumari,** increasing **concerns about pollution** in the waters due to the vessel.

Legal and Regulatory Fallout

- The **National Green Tribunal (NGT)** has taken suo motu cognizance of the incident, citing possible violations of:
  - Biodiversity Act, 2002
  - Water (Prevention and Control of Pollution) Act, 1974
  - Environment Protection Act, 1986.

- **Notices** have been issued to multiple agencies, including:
  - Kerala Pollution Control Board;
  - Central Pollution Control Board.

DAM PROJECT ON THE SIANG RIVER

Context

- Recently, the **Arunachal Pradesh** government claimed it had signed **a MoU with a village in Siang district** for a **pre-feasibility survey** for **India's largest planned dam project** on the Siang river.

About Siang Upper Multipurpose Project (SUMP)

- It is an **11.2-gigawatt mega-dam** in Arunachal Pradesh's Upper Siang district.
  - Siang River is known as the Yarlung Tsangpo in Tibet and a vital tributary of the Brahmaputra.
  - It originates near Mount Kailash in Tibet, where it is known as the Yarlung Tsangpo.
- This project was **proposed by NITI Aayog in 2017** and now under **pre-feasibility study** by the **National Hydroelectric Power Corporation (NHPC)**.
  - China is constructing a massive 66-GW hydropower project upstream on the Yarlung Tsangpo.
- **Multipurpose Nature:** Flood Control; Irrigation; Water Supply

Environmental and Social Concerns

- **Displacement of Local Communities:** The construction of dams and reservoirs result in the displacement of people who live along the river, particularly **Adi community.**
- **Ecological Impact:** Alterations to the river ecosystem affect biodiversity, fisheries, and downstream water availability.
- **Seismic Risks**: The region is earthquake-prone, raising concerns about the safety of large dams in such an area.

SPONGE PARKS

Context

- Chennai is implementing sponge parks to mitigate waterlogging. But they may not be the best solution.

Sponge Parks in India

- Sponge parks are landscaped urban green spaces that **absorb, filter, and store rainwater.**
- These are the **green, absorbent public spaces** designed to **mimic nature's way of managing water.**
- They use permeable surfaces, bioswales, rain gardens, and native vegetation to slow down runoff, recharge aquifers, and reduce the load on stormwater drains.
- It is inspired by the **'sponge city' concept** pioneered in **China**.

Policy Push and Pilot Projects

- The **Ministry of Housing and Urban Affairs (MoHUA)** has encouraged cities under the **AMRUT and Smart Cities Missions** to integrate sponge park elements into urban planning.
- **Pilot projects** in cities like **Pune, Bengaluru, and Bhubaneswar** are exploring the use of green infrastructure to manage stormwater and improve urban resilience.

- The **National Institute of Urban Affairs (NIUA)** released guidelines in 2023 **promoting nature-based solutions** for climate adaptation, with sponge parks cited as a key intervention.

Challenges and the Road Ahead

- Lack of technical expertise in hydrological landscaping
- Fragmented urban governance
- Limited public awareness about their multifunctional benefits

SUBJECTIVE QUESTIONS

1. Critically examine the progress and persistent challenges faced by Panchayati Raj Institutions in India over the past three decades since the implementation of the 73rd Constitutional Amendment.
2. Discuss the implications of India's Ethanol-Blending Programme on food crop utilization and food security. In your view, how can the country balance its clean energy goals with sustainable agricultural and nutritional priorities?

MCQS

1. The *Janjehli valley*, sometimes appeared in the news, is located in:
   (a) Uttarakhand
   (b) Himanchal Pradesh
   (c) Arunanchal Pradesh
   (d) Sikkim
2. The *Tal Chhapar Wildlife Sanctuary*, sometimes appeared in the news, is located in:
   (a) Madhya Pradesh
   (b) Chhattishgarh
   (c) Maharashtra
   (d) Rajasthan
3. With reference to the *'Mercosur bloc'*, consider the following statements:
   1. It is a regional trade alliance in western Europe.
   2. It has its own regional standards organization.

   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
4. The *Inga Hydropower Project*, sometimes appeared in the news, is located at which one of the following rivers?
   (a) Congo
   (b) Niger
   (c) Zambezi
   (d) Nile
5. Recently, *MSC ELSA 3*, was in the news. What was it?
   (a) Radar System
   (b) Container Vessel
   (c) Hydrogen Engine
   (d) Gravity Model

Answer Key:_____

1. (b) 2. (d) 3. (b) 4. (a) 5. (b)

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