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1995-2025

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TREND ANALYSIS: UPSC CSE (2019-2025)

Subject-wise Distribution of Questions: CSE 2025-GS (Paper-I)	
Subject	**Number of Questions**
Polity	14
Economy	14
Ancient History	4
Medieval History	3
Art and Culture	1
Modern History	8
Geography	12
Environment	13
Science and Technology	13
Current Affairs	18

PYQ (2019-2025) Analysis							
Topic/Subject	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Polity	13	17	15	11	12	18	14
History and Art & Culture	16	19	18	17	13	8	16
Geography	7	8	7	7	17	20	12
Environment and Ecology	17	18	19	12	18	14	13
Economy	16	19	14	12	8	12	14
Science and Technology	12	12	12	12	7	10	13
International Relations/Current Affairs/General Knowledge	19	7	15	29	25	18	18
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

CUT-OFF TRENDS (2019-2024)						
Category	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
UR	98.00	92.51	87.54	88.22	75.41	87.98
OBC	95.34	89.12	84.85	87.54	74.75	87.28
EWS	90.00	77.55	80.14	82.83	68.02	85.92
SC	82.00	74.84	75.41	74.08	59.25	79.03
ST	77.34	68.71	70.71	69.35	47.82	74.23
PwBD-1	53.34	70.06	68.02	49.84	40.40	69.42
PwBD-2	44.66	63.94	67.33	58.59	47.13	65.30
PwBD-3	40.66	40.82	43.09	40.40	40.40	40.56
PwBD-5	61.34	42.86	45.80	41.76	33.68	40.56

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UPSC CSE Prelims 2025 GS Paper-I (Questions and Explanation)

1. Consider the following types of vehicles:

1. Full battery electric vehicles
2. Hydrogen fuel cell vehicles
3. Fuel Cell electric hybrid vehicles

How many of the above are considered as alternative powertrain vehicles?

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

Ans: (*c*) Alternative Powertrain Vehicles: Vehicles using propulsion systems other than conventional petrol or diesel internal combustion engines (ICEs), focusing on sustainable transport via electricity, hydrogen, or hybrid systems.

Full Battery Electric Vehicles (BEVs): Powered solely by electricity in rechargeable battery packs, using electric motors, no ICE, fuel tank, or exhaust.

Key Features:

- Zero tailpipe emissions, reducing environmental impact.
- Efficiency depends on electricity source (renewable vs. fossil fuels).
- Examples: Tesla Model 3 (2017), Tata Nexon EV (2020).

Hydrogen Fuel Cell Vehicles (FCEVs): They generate electricity via hydrogen-oxygen electrochemical reaction in fuel cell stack, powering electric motors; emit water vapor, heat.

Key Features:

- Zero-emission, suited for long-range, heavy-duty applications with fast refueling.
- Examples: Toyota Mirai (2014), Hyundai Nexo (2018).

Fuel Cell Electric Hybrid Vehicles (FCE-HVs): They integrate hydrogen fuel cells and rechargeable batteries to power electric motors, using regenerative braking (turns kinetic energy into electricity by reversing the process that drives the car forward.)

Key Features:

- Combine fuel cell range, battery power for efficiency.
- Examples: Toyota, Honda prototypes (2020s).

Hence, option (c) is correct.

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You can try, The "NOT" approach for all statements, this tests the improbability of negating a statement—if denying its impact seems highly unlikely, the statement is plausibly true. For example: *Is it likely that a BEV is **not** an alternative powertrain?* **Illogical to deny** — BEVs are the **poster child** of alternative power. Similarly all other options are also likely true.

2. With reference to Unmanned Aerial Vehicles (UAVs), consider the following statements:

1. All types of UAVs can do vertical landing.
2. All types of UAVs can do automated hovering.
3. All types of UAVs can use battery only as a source of power supply.

How many of the statements given above are correct?

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

Ans: (*d*) Statement 1 is incorrect**:** Only **Vertical Takeoff and Landing (VTOL) UAVs**, like **multi-rotor drones** (e.g., **DJI Phantom**, **Skydio quadcopters/hexacopters**, 2014) and certain **hybrid tilt-rotor drones**, can land vertically. **Fixed-wing UAVs** (e.g., **NASA Global Hawk**, **MQ-1 Predator**, **Wing Loong**, 1994) require **runways**, **catapults**, or **recovery systems** (e.g., **net**, **parachute**) and cannot land vertically. **Hybrid UAVs** vary by design. **Fixed-wing UAVs** excel in **energy efficiency**, **endurance**, and **speed**, ideal for **surveillance** and **long-range missions**, unlike **multi-rotor drones** suited for **precision tasks**.

Statement 2 is incorrect**:** Only **rotary-wing** and **multi-rotor UAVs** (e.g., **DJI Phantom**, **Skydio**, 2014) **hover**, using **vertical thrust** from **propellers** with **GPS/stabilization systems** can do automated hovering.

Fixed-wing UAVs (e.g., **MQ-9 Reaper**, **Global Hawk**, 2001) require **forward motion** for **lift** and cannot **hover**. Some **VTOL**-capable **fixed-wing UAVs** (e.g., **tilt-rotor**) can **hover**, but not universally. **Hovering** suits **aerial photography**, **surveillance**, **delivery**, and **rescue**.

Statement 3 is incorrect**: UAVs** use diverse **power sources**: **batteries** (**Lithium-ion/LiPo** for small/medium **multi-rotor drones**, e.g., **DJI Mavic Air**, **Skydio**, 2018), **gasoline** (**military drones** like **MQ-9 Reaper**, **DRDO Rustom**, **Nishant**, 2008), **hybrid systems**, **solar** (**HALE UAVs** like **AeroVironment's**, 2010), or **hydrogen fuel cells**. **Power choice** depends on **mission**, **endurance**, **range**, and **payload.**

Hence, option (d) is correct.

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"All types" → Absolute Scope = High Risk of Being Wrong. When a statement says "all types", it means no exceptions are allowed. So just one counterexample is enough to invalidate the statement.

For example: Can we imagine a UAV that cannot do vertical landing? Yes — fixed-wing UAVs need runways and cannot land vertically. Similarly for S2, fixed-wing UAVs again need continuous motion to generate lift, so they cannot hover and For S3, military UAVs, large surveillance drones, and solar UAVs don't rely only on batteries. Hence all three statements are likely false.

3. In the context of electric vehicle batteries, consider the following elements:

1. Cobalt
2. Graphite
3. Lithium
4. Nickel

How many of the above usually make up battery cathodes?

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

Ans: (c)

In **electric vehicle lithium-ion batteries**, **cobalt**, **lithium**, and **nickel** form **cathodes** determining **energy density**, **lifespan**, **cost**, and **performance**. **Graphite** is used exclusively in **anodes**, not **cathodes**. **Electrolytes** enable **lithium ion** movement, while **separators** prevent **short circuits**, allowing **ion flow**.

Lithium-ion cell types are generally recognised by the cathode material. Some of the most common lithium-ion variants (based on cell chemistry) are NMC (Lithium nickel manganese cobalt), LFP (Lithium ferro (iron) phosphate), NCA (Lithium nickel cobalt aluminium oxide), LMO (Lithium manganese oxide) and LCO (Lithium cobalt oxide).

Element-Wise Analysis

- **Cobalt**: Enhances **thermal stability**, extends **lifespan** in **LCO**, **NMC**, **NCA**. Used in **smartphones**, **laptops** (**LCO**), **EVs Challenges**: Expensive, toxic, 70% sourced from **Democratic Republic of Congo (DRC)**, raising ethical concerns.
- **Lithium**: Critical for **cathode** (**$LiCoO_2$**, **$LiNiMnCoO_2$**, **$LiNiCoAlO_2$**, **$LiFePO_4$**) and **electrolyte**. Enables **high voltage**, sourced from **Lithium Triangle** (Chile, Argentina, Bolivia) and **Australia**.
- **Nickel**: Boosts **energy density**, **range** in **NMC**, **NCA** (80% of **EV battery capacity**, 2021). Supplied by **Indonesia**, **Russia**, **Philippines**. **Challenge**: Reduces **thermal stability**, needs **cobalt**, **manganese**.
- **Graphite**: Exclusive to **anodes** (28% of **EV battery** minerals), not **cathodes**. **Natural/synthetic graphite** intercalates **lithium ions** for **conductivity**, **stability**. **China** dominates **anode-grade graphite**. Research explores **silicon anodes**.

Hence, option (c) is correct.

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Among the four, only **Graphite is a non-metal**, and unlike the metals (Cobalt, Lithium, Nickel), it is used in the **anode**, not the cathode — making it the logical odd one out." Hence giving option C as likely correct.

4. Consider the following:

1. Cigarette butts
2. Eyeglass lenses
3. Car tyres

How many of them contain plastic?

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

Ans: (c) Plastics are **synthetic polymers** widely used in modern products due to their versatility, durability, and cost-effectiveness.

Cigarette Butts: Cigarette butts, made of **cellulose acetate**, are the most littered plastic waste worldwide, with **4.5 trillion** butts discarded annually—**66%** of the **6 trillion** cigarettes smoked. Each releases about **15,000 microplastic fibers**, leaching **nicotine, arsenic, and lead**, and takes up to **10 years** to degrade.

Eyeglass Lenses: Eyeglass lenses are now mostly plastic—**CR-39**, **polycarbonate** (used in 90% of glasses), **Trivex**, and **high-index plastics**—preferred for being lightweight, shatter-resistant, and optically clear. Improper disposal contributes to plastic waste, but recycling remains limited.

Car Tyres: Car tyres contain **24% synthetic rubber**, **19% natural rubber**, **carbon black**, and synthetic fibers like **nylon** and **polyester**. **Tyre wear particles (TWPs)** contribute **10–28%** of oceanic microplastics, totaling **1.2–2.8 million tonnes** annually.

Hence, option (c) is correct.

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Microplastics, fragments of plastic less than 5 mm, originate from primary sources (e.g., microbeads in cosmetics) or secondary sources (e.g., breakdown of larger plastics like synthetic fabrics or tyres). They are a global pollution threat, found in oceans, air, soil, food, and even human organs, contributing to environmental and health concerns.

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You can try, The "NOT" approach for all statements, this tests the improbability of negating a statement—if denying its impact seems highly unlikely, the statement is plausibly true. For example: Saying *"Cigarette butts, Eyeglass lenses or car tyres do not contain plastic"* seems highly implausible, suggesting that all three do contain plastic.

5. Consider the following substances:

1. Ethanol
2. Nitroglycerine
3. Urea

Coal gasification technology can be used in the production of how many of them?

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

Ans: (b) Ethanol and urea can be produced via coal gasification, while nitroglycerine is not practically produced due to the lack of a viable glycerol synthesis pathway from syngas.

Coal Gasification: It is a **thermo-chemical process** that converts **coal** into **syngas** (synthesis gas), a mixture of **carbon monoxide (CO)**, **hydrogen (H_2)**, **carbon dioxide (CO_2)**, and **methane (CH_4)**, through partial oxidation with **oxygen** and **steam** under high **temperature** (1000°C or more) and **pressure**.

- **Syngas** serves as a versatile **chemical feedstock** for producing **fuels**, **fertilizers**, and **chemicals**, supporting India's **National Coal Gasification Mission (2021)** to gasify 100 million tonnes of **coal** by **2030** to reduce imports of **natural gas**, **urea**, and **methanol**.

Ethanol: Production via Coal Gasification

- **Process**: **Ethanol (C_2H_5OH)** is produced from **syngas** through **catalytic conversion** (e.g., **Fischer-Tropsch synthesis** with **rhodium-based catalysts**) or **microbial fermentation** (e.g., using **Clostridium ljungdahlii**).
- **Relevance**: **Syngas** provides **carbon monoxide** and **hydrogen**, which are converted to **ethanol** as part of **coal-to-liquids (CTL)** processes. This supports India's **20% ethanol blending policy** (G20 Biofuel Policy) to reduce **crude oil imports**.

1 Ancient History

1. CONSTRUCTION OF ANCIENT HISTORY

1. Consider the following information: (2024)

	Archaeological Site	State	Description
1.	Chandraketugarh	Odisha	Trading Port town
2.	Inamgaon	Maharashtra	Chalcolithic site
3.	Mangadu	Kerala	Megalithic site
4.	Salihundam	Andhra Pradesh	Rock-cut cave shrines

In which of the above rows is the given information correctly matched?

(*a*) 1 and 2 (*b*) 2 and 3
(*c*) 3 and 4 (*d*) 1 and 4

Ans: (*b*) Pair 1 is incorrectly matched: Chandraketugarh is **not located in Odisha.** It is actually an archaeological site in West Bengal, near Kolkata. It is known for its historical significance as an ancient trading hub and port town, dating back to the pre-Mauryan and Gupta periods. **It is an urban centre** of the ancient state of Gangaridai belonging to the trans-Bengal region at the interface of **West Bengal and Bangladesh**.

The antiquity of the area dates back to eras as early as **4th century BCE**, a period much prior to the Mauryan era and shows evidence in the continuity of subsequent Sunga, Kushana, Gupta, Pala and Sena dynasties.

Pair 2 is correctly matched : Inamgaon is a chalcolithic site in Maharashtra. After the disintegration of the Indus civilization, in a phase known as the Early Jorwe (1400– 1000 BC), hundreds of agrarian villages flourished in the Deccan region of west-central India. Environmental degradation, combined with unsustainable agricultural practices, contributed to the abandonment of many communities around 1000 BC. Inamgaon was one of a handful of villages to persist into the Late Jorwe phase (1000–700 BC), wherein reliance on dry-plough agricultural production declined. The site provides evidence of early farming communities, pottery, and burial practices. It is considered a key site for understanding the Deccan Chalcolithic culture.

Pair 3 is correctly matched : Mangadu is a Megalithic Site in Kerala. The megalithic monuments at Mangadu consisted of 28 hard compact and unhewn laterite blocks within an area of 5 cents of land. The pottery at Mangadu can be classified into three categories namely the huge urns, the medium sized jars are hand made. The associated potteries are of wheel-made pottery and the fabric is black and red and red wares.

Pair 4 is incorrectly matched : Salihundam is a Buddhist Site in Andhra Pradesh as early as the 2nd century CE to the 12th century CE. Here, Buddhism flourished under the patronage of various dynasties, including the Satavahanas, Ikshvakus, and the Eastern Ganga dynasty. The archaeological excavations have revealed numerous stupas, chaityas, viharas and a congregation hall, indicating the importance of this site in the transmission of Buddhist knowledge and wisdom. Rock cut caves are not found in Salihundam.

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For Row 4, Trust what you've read. If you haven't read about something, chances are it doesn't exist or isn't significant. Heard of rock-cut caves in Maharashtra? Yes—Ajanta, Ellora. In Odisha? Yes—Udayagiri, Khandagiri. Even MP and Bihar have them. But Andhra? Never come across any major rock-cut caves from there. So, if UPSC calls Salihundam that, it's probably wrong. Row 4 is more likely false. Thus eliminating options C and D. Row 1 was a recent PYQ, hence should have been well known, giving option B as correct.

2. In which one of the following regions was Dhanyak-ataka, which flourished as a prominent Buddhist centre under the Mahasanghikas, located (2023)

(*a*) Andhra (*b*) Gandhara
(*c*) Kalinga (*d*) Magadha

Ans: (*a*) Amaravati in **Andhra Pradesh** holds historical significance as the site of ancient **Dhanyakataka**, a prominent town in the Deccan region of the **later Satavahanas**, as recorded in numerous inscriptions. This area also housed a significant Buddhist settlement. According to some Tibetan scriptures Dhanyakataka is the place where early Kalachakra tradition took off.

Kalachakra is a Buddhist tantric practice. It was a significant hub of **Mahayana Buddhism** and was associated with the **Mahasanghika** sect. The famous **Amaravati Stupa**, one of the largest Buddhist stupas in India, is located near this site.

Options (*b*), (*c*) and (*d*) are incorrect :

- **Gandhara** (Pakistan-Afghanistan region) was a center of **Gandhara art and Mahayana Buddhism**.
- **Kalinga** (Odisha) was significant for **Ashoka's Buddhist transformation** but not specifically for the **Mahasanghikas**.
- **Magadha** (Bihar) was the heartland of **early Buddhism** but not linked to Dhanyakataka.

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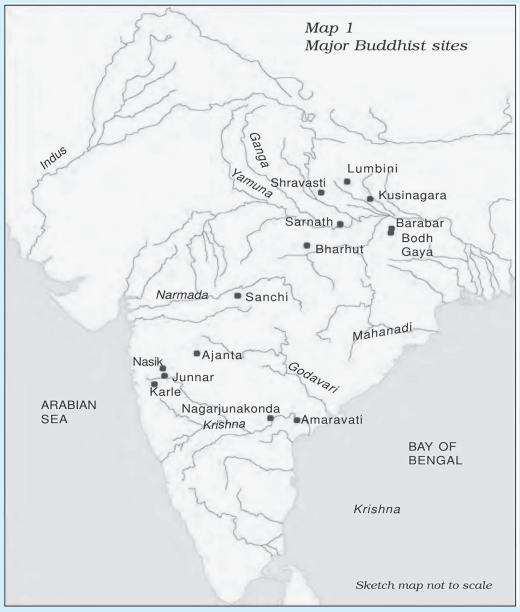
Major ancient Buddhist Sites :



3. With reference to ancient South India, Korkai, Poom-puhar and Muchiri were well-known as: (2023)

(*a*) Capital cities

(*b*) Ports

(*c*) Centres of iron-and-steel making

(*d*) Shrines of Jain Tirthankaras

Ans: (*b*) Korkai, **Poompuhar**, and **Muchiri** were prominent **ancient port cities** in South India that played a crucial role in maritime trade.

- **Korkai :** Korkai, situated in the Thoothukudi district of **Tamil Nadu**, emerged as a significant port city during ancient times, notably flourishing during the era of Tamil Sangam literature. It served as the primary port for the **Pandya Kingdom** during this period.
- **Poompuhar:** Alternatively known as **Kaveripattinam**, it stands out as an ancient port city with a vibrant maritime trading legacy. Positioned on the banks of the Kaveri River in the **Mayiladuthurai district** of **Tamil Nadu**, it served as the primary port for the esteemed **Chola Kingdom**.
- **Muchiri :** Muchiri, alternatively referred to as Muziris, stood as an **ancient port city** situated in what is now **Kerala**, close to the town of Kodungallur. It held substantial importance as a trading hub within the Indian Ocean trade network throughout the ancient and medieval eras. Tondi and Muchiri emerged as pivotal ports within the realm of the Chera kingdom. Hence, all the three sites mentioned were well known as Ports in ancient South India.

4. Which one of the following explains the practice of 'Vattakirutal' as mentioned in Sangam poems? (2023)

(*a*) Kings employing women bodyguards

(*b*) Learned persons assembling in royal courts to discuss religious and philosophical matters

(*c*) Young girls keeping watch over agricultural fields and driving away birds and animals

(*d*) A king defeated in a battle committing ritual suicide by starving himself to death

Ans: (*d*) Vatakkiruttal, also known as Vadakiruthal or Vadakiruttal, was particularly prevalent during the **Sangam period (3rd century BCE to 2nd Century CE)**. Tamil Kings, in a bid to uphold their honor and prestige, were willing to face death by fasting, a practice known as "Vatakkiruttal."

5. Consider the following pairs: (2021)

	Historical place	Well known for
1.	Burzahom	Rock cut shrines
2.	Chandraketugarh	Terracotta art
3.	Ganeshwar	Copper artefacts

Which of the pairs given above is/are correctly matched?

(*a*) 1 only (*b*) 1 and 2

(*c*) 3 only (*d*) 2 and 3

Ans: (*d*) India's historical sites highlight diverse peculiarities as Bhimbetka's prehistoric rock art, Nalanda's ancient university, Sanchi's stupas, Dholavira's urban planning, Pattadakal's Chalukyan temples, and Khajuraho's erotic sculptures, reflecting the subcontinent's rich contributions to art, architecture, and education across areas.

Pair 1 is *incorrectly* matched: Burzahom (Kashmir) had a well-developed **bone tool industry**. Other finds at Burzahom include pits and coarse pottery. **Rock-cut shrines** were **not** a feature of the **Burzahom site.**

Pair 2 is correctly matched: Chandraketugarh is located in the Ganges delta in West Bengal. It is known for its rich collection of **terracotta plaques** and figurines that date back to the pre-Mauryan and Gupta periods.

Pair 3 is correctly matched: Ganeshwar is located in the northeastern part of Rajasthan. Hundreds of copper artifacts have been found at this site which suggests it must have been a copper working center.

6. In the context of the history of India, consider the following pairs: (2016)

	Term	Description
1.	Eripatti	Land revenue which was set apart for the maintenance of the village tank
2.	Taniyurs	Villages donated to a single Brahmin or a group of Brahmins
3.	Ghatikas	Colleges generally attached to the temples

Which of the pairs given above is correctly matched?

(*a*) 1 and 2 (*b*) 3 only

(*c*) 2 and 3 (*d*) 1 and 3

Ans: (*d*) Pair 1 is correctly matched: Eripatti was a **special kind of land donated** by individuals. The revenue from it was set aside for the **maintenance of tanks** in the village.

Pair 2 is *incorrectly* matched: During the Chola administration, occasionally a very large village would be administered as a single unit and this was called Taniyur**.** These villages were not necessarily just large administrative units but could also be village settlements that were either wholly or largely populated by Brahmins or associated with religious functions.

Pair 3 is correctly matched: Ghatikas were educational institutions, often associated with temples, where learning took place. These colleges were centers for higher education, particularly in subjects like philosophy, logic, and religious studies.

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Here is a list of similar historical terms related to land revenue, administration, and education in ancient India:

Term	Description
Brahmadeya	Land grants given to Brahmins, often leading to the formation of Agrahara villages.
Devadana	Land donated to temples for religious and charitable purposes.
Vellanvagai	Land held by non-Brahmin, peasant communities in the Chola administration.
Pallichchandam	Land grants given to Buddhist monasteries and Jaina institutions.
Salabhoga	Land or revenue assigned for the maintenance of educational institutions.
Agrahara	A village or settlement granted to Brahmins, often exempt from taxes.
Ghatika	Educational institutions, often attached to temples, known for higher learning.
Matha	Hindu monasteries that functioned as centers of religious and educational activities.
Vasti	Residential settlements.
Nagaram	Towns or trade centers that played a significant role in urbanization.

7. With reference to the scientific progress of Ancient India,which of the statements given below are correct? (2012)

1. Different kinds of specialized surgical instruments were in common use by the 1st century AD.
2. Transplant of internal organs in the human body began in the 3rd century AD
3. The concept of sine of an angle was known in the 5th century AD.
4. The concept of cyclic quadrilateral was known in the 7th century AD.

Select the correct answer using the codes given below:

(*a*) 1 and 2 only (*b*) 3 and 4 only

(*c*) 1, 3 and 4 only (*d*) 1, 2, 3 and 4

Ans: (*c*) Ancient India made significant contributions to science, particularly in mathematics, astronomy, and medicine. Achievements include the concept of zero and the decimal system, advancements in surgery and the accurate calculations of the Earth's circumference**.**

Statement 1 is correct: Ancient Indian texts like the Sushruta Samhita (6th century BC) describe specialized **surgical instruments** for procedures such as surgery, eye treatments, and plastic surgery, indicating well-developed surgical knowledge by the **1st century AD.**

Statement 2 is *incorrect*: There has been no documented proof of organ transplants in the 3rd century AD. The concept of **organ transplantation** is much more modern, developing in the **20th century**.

Statement 3 is correct: Aryabhata, in the **5th century AD**, improvised the **concept of sine** (jya in Sanskrit) in his book and used it in astronomical calculations. Aryabhata's work in trigonometry laid the foundation for later developments in mathematics.

Statement 4 is correct: The concept of **cyclic quadrilaterals**, where a quadrilateral can be inscribed in a circle, was known to Brahmagupta in the **7th century AD**, who also provided a formula for their area.

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- Aryabhata (approximately 476 CE) was an Indian mathematician-astronomer who wrote Aryabhatiya and the lost Aryabhatasiddhanta. He helped develop the decimal system, approximated π, solved quadratic equations, and explained planetary motion. He proposed Earth's rotation and the Moon's reflected light.
- Brahmagupta (approximately 598–665 CE) was a pioneering Indian mathematician-astronomer. In Brahma-sphuta-siddhanta (628), he introduced rules for zero, negative numbers, and quadratic equations. He formulated a cyclic quadrilateral area formula and contributed to trigonometry. His work influenced Islamic mathematics after its Arabic translation. He later wrote Khandakhadyaka (665), refining astronomical calculations.

8. With reference to the Guilds (Shrenis) of ancient India that played a very important role in the country's economy, which of the following statements is/are true? (2012)

1. Every Guild was registered with the central authority of the state and the King was the chief administrative authority on them
2. The wages, rules of work, standards and prices were fixed by the Guild
3. The guild had judicial powers over its own members.

Select the correct answer using the codes given below:

(*a*) 1 and 2 only (*b*) 3 only

(*c*) 2 and 3 only (*d*) 1, 2 and 3

Ans: (*c*) As mentioned in Arthshastra, Guilds, also known as Shrenis or Trade Guilds, played a significant role in ancient Indian society. These organizations brought together artisans, merchants, and traders to promote their collective interests, provide protection, and facilitate trade.

Statement 1 is *incorrect*: The king or local rulers protected guilds and ensured compliance with state regulations, but **guilds operated autonomously** and were **not always** formally registered **with** the **central authority.**

Statement 2 is correct: Guilds had significant control over the economic activities of their members. They were responsible for regulating various aspects of production, trade, and commerce, which included setting wages, standards of workmanship, prices for goods, and rules of operation.

Statement 3 is correct: Guild members were entitled to impeach and punish a chief found guilty of misconduct. The Arthashastra describes the role of guilds in resolving disputes through a Shreni court, where matters related to trade, contracts, and disagreements were handled by the guild's officials.

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For S1, Absolute words like "Every" – they're usually a red flag. Also, If guilds were known to be autonomous (As S2 mentions), would it make sense for the king to directly administer them? No!, Hence S1 likely false, eliminate options A and D as S1 and S2 contradicts each other.

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CONTENTS

Reading Comprehension

UPSC CSE 2025 GS Paper-II (Questions and Explanation)

Directions for the following 4 (four) items:

Read the following two passages and answer the items that follow the passages. Your answers to these items should be based on the passages only.

Passage - 1

In our country, regrettably, teaching and learning for the examination have been our forte but the new demands of society and the future of work require critical and independent thinking, learning through doing, asking questions from multiple disciplinary perspectives on the same issue, using evidence for building arguments, and reflecting and articulation. Higher education should not "either be a mere servant of the government policy or a passive respondent to public mood." Higher learning is all about how to think rather than what to think. Teaching has to be re-invented.

1. Which one of the following statements best reflects the central idea conveyed by the passage?

(*a*) India does not have enough resources for promoting quality education in its universities.

(*b*) The institutions of higher learning in the country should not be under the control of the Government.

(*c*) Classroom approach to higher education should be done away with.

(*d*) Classroom needs to be reimagined and teaching needs to be re-invented.

Ans: (*d*)

Option (*a*) is incorrect: The passage does not discuss resource availability or funding issues for higher education.

Option (*b*) is incorrect: The passage mentions that higher education should not be a mere servant of government policy or public mood, but it does not explicitly call for removal of government control.

Option (*c*) is incorrect: The passage does not advocate for eliminating classroom approaches but suggests reimagining the classroom and reinventing teaching methods.

Option (*d*) is correct: The passage emphasizes the need for **critical and independent thinking**, **learning by doing**, and **teaching to be reinvented**, suggesting a **reimagined classroom** and innovative teaching.

2. With reference to the above passage, the following assumptions have been made:

I. Higher education is a constantly evolving subject that needs to align towards new developments in all spheres of society.

II. In our country, sufficient funds are not allocated for promoting higher education.

Which of the above assumptions is/are valid?

(*a*) I only (*b*) II only

(*c*) Both I and II (*d*) Neither I nor II

Ans: (*a*)

Assumption I is correct: The passage implies that higher education must evolve and adapt to **new societal demands and future work requirements**, which aligns with this assumption.

Assumption II is incorrect: The passage does not mention funding or financial allocation issues. Therefore, assuming a lack of funds is unsupported.

Passage - 2

If there is inequality in the pattern of population growth, there is greater inequality in food production and utilization. As societies become wealthier, their consumption of animal products increases. This means that a greater proportion of such basic foodstuff as grains and legumes that could feed humans directly is instead being converted into feed for poultry and large farm animals. Yet this conversion of plant-based food into animal food for humans is far from efficient. Only 16% of the calories fed to chickens are recovered by us when we eat them. This conversion rate goes down to five to seven per cent in large animals that are fed grain to add fat and some protein before slaughter.

3. Which one of the following statements best reflects the crux of the passage?

(*a*) There is an urgent need for a public policy to promote the consumption of cereal-based foods in wealthier societies.

(*b*) Animal-based food is far less efficient than grain/plant-based food in terms of production and utilization.

(*c*) Plant-based protein should replace the animal-based protein in our daily diets.

(*d*) Inequality in food production and consumption is inevitable in any fast changing society.

Ans: (*b*)

Option (*a*) is incorrect: Although the passage points out inefficiencies, it does not explicitly call for public policy to promote cereal-based food consumption in wealthier societies.

Option (*b*) is correct: The passage **clearly shows that animal-based food production is less efficient than directly consuming grain/plant-based foods**, supporting this statement as the central idea.

Option (*c*) is incorrect: The passage discusses efficiency but does not explicitly advocate for replacing animal protein with plant protein in diets.

Option (*d*) is incorrect: While inequality is mentioned, the passage does not suggest it is inevitable or focus on this as the main idea.

4. With reference to the above passage, the following assumptions have been made:

I. The food manufacturing and processing industries in every country should align their objectives and processes in accordance with the changing needs of the societies.

II. Wealthier societies tend to incur great loss of calories of food materials due to indirect utilization of their agricultural produce.

Which of the above assumptions is/are valid?

(*a*) I only (*b*) II only

(*c*) Both I and II (*d*) Neither I nor II

Ans: (*b*)

Assumption I is incorrect: The passage does not mention or imply anything about the objectives or processes of food manufacturing and processing industries needing alignment with societal changes. This assumption goes beyond the information provided.

Assumption II is correct: The passage clearly shows that in wealthier societies, indirect utilization of agricultural produce (through feeding animals) results in significant calorie loss, supporting this assumption.

5. What is the maximum value of n such that 7 × 343 × 385 × 1000 × 2401 × 77777 is divisible by 35^n?

(*a*) 3 (*b*) 4 (*c*) 5 (*d*) 7

Ans: (*b*)

We can write $35^n = (5 \times 7)^n$

We can write, $7 \times 343 \times 385 \times 1000 \times 2401 \times 77777$

$= 7 \times 7^3 \times (5 \times 7 \times 11) \times (5^3 \times 8) \times 7^4 \times (7 \times 11111)$

$= 7^{10} \times 5^4 \times 11 \times 8 \times 11111$

We can see that number of 7s is more than number of 5s

So, the value of 'n' will depend upon the number of 5

Since, number of 5s = 4

So, maximum value of n = 4

6. What is X in the sequence 24, X, 12, 18, 36, 90?

(*a*) 18 (*b*) 12 (*c*) 9 (*d*) 6

Ans: (*b*)

The given series follows the pattern as:

$24 \times 0.5 = 12$

$12 \times 1 = 12 = X$

$12 \times 1.5 = 18$

$18 \times 2 = 36$

$36 \times 2.5 = 90$

7. P and Q walk along a circular track. They start at 5:00 a.m. from the same point in opposite directions. P walks at an average speed of 5 rounds per hour and Q walks at an average speed of 3 rounds per hour. How many times will they cross each other between 5:20 a.m. and 7:00 a.m.?

(*a*) 12 (*b*) 13 (*c*) 14 (*d*) 15

Ans: (*b*)

Relative speed of 'P' with respect to 'Q' = 5 + 3 = 8 rounds per hour (Since, they are moving in opposite directions)

So, time after which they meet = $\frac{60}{8} = 7.5$ i.e. 7 minutes 30 seconds

So, they will cross each other after 7 minutes 30 seconds.

So, the instances they cross each other between 5:00 a.m. and 7:00 am are:

5:7:30, 5:15:00, 5:22:30, 5:30:00, 5:37:30, 5:45:00, 5:52:30, 6:00, 6:7:30, 6:15:00, 6:22:30, 6:30:00, 6:37:30, 6:45:00, 6:52:30 and 7:00

Since, we have to consider the scenario between 5:20 a.m. and 7:00 a.m. so we cannot take instances 5:7:30, 5:15:00 and 7:00 (as they will cross after 7 o'clock and not exactly at 7 o'clock)

So, we have 13 such instances.

Alternate Solution:

Relative speed of 'P' with respect to 'Q' = 5 + 3 = 8 rounds per hour (Since, they are moving in opposite directions)

So, they will meet in 8 times in 60 minutes

Since, the time between 5:20 a.m. and 7:00 a.m. = 40 + 60 = 100 minutes.

So, the number of times they will meet in 100 minutes $= 8 \times \frac{100}{60} \sim 13.33$

8. If P = +, Q = –, R = ×, S = ÷, then insert the proper notations between the successive numbers in the equation 60_15_3_20_4 = 20:

(*a*) SPRQ (*b*) QRPS (*c*) QRSP (*d*) SPQR

Ans: (*b*)

Going through options, we have;

For option (a) : SPRQ i.e. ÷, +, × and –

$60 \div 15 + 3 \times 20 - 4 = 4 + 60 - 4 = 60 \neq 20$

So, option (a) is not correct.

For option (b) : QRPS i.e. –, ×, + and ÷

$60 - 15 \times 3 + 20 \div 4 = 60 - 45 + 5 = 20$

So, option (b) is correct.

9. A tram overtakes 2 persons X and Y walking at an average speed of 3 km/hr and 4 km/hr in the same direction and completely passes them in 8 seconds and 9 seconds respectively. What is the length of the tram?

(*a*) 15 m (*b*) 18 m (*c*) 20 m (*d*) 24 m

Ans: (*c*)

Let speed of tram be 's' km/h and length of the tram be 'l' metres

According to question

The tram overtakes 'X' in 8 seconds

So, $l = (s - 3) \times \frac{5}{18} \times 8$ ...(*i*)

Also, the tram overtakes 'Y' in 9 seconds

So, $l = (s - 4) \times \frac{5}{18} \times 9$ ...(*ii*)

Equating equations (i) and (ii), we have

$(s - 3) \times \frac{5}{18} \times 8 = (s - 4) \times \frac{5}{18} \times 9$

Or, $8s - 24 = 9s - 36$

Or, $s = 36 - 24 = 12$

So, length of tram = $(s - 3) \times \frac{5}{18} \times 8$

$= (12 - 3) \times \frac{5}{18} \times 8 = 9 \times \frac{5}{18} \times 8 = 20$ metres

10. If N^2 = 12345678987654321, then how many digits does the number N have?

(*a*) 8 (*b*) 9 (*c*) 10 (*d*) 11

Ans: (*b*)

We know that

11^2 = 121; number of digits = 2

111^2 = 12321; number of digits = 3

1111^2 = 1234321; number of digits = 4

11111^2 = 123454321; number of digits = 5

Similarly, following the same pattern

111111111^2 = 12345678987654321; number of digits = 9

Alternate Solution:

If a number have 'n' digits then number of digits in its square can be either '2n' or (2n – 1)

Number of digits in the given expression = 18

So, here either 2n = 18 or 2n – 1 = 18

So, either n = 9 or n = 9.5 (not possible)

So, 'N' will have 9 digits

Directions for the following 4 (four) items:

Read the following two passages and answer the items that follow the passages. Your answers to these items should be based on the passages only.

Passage - 1

One of the dismal realities of the agricultural sector in independent India has been that it never experienced a high-growth phase, unlike the non-agricultural economy. The highest decadal growth (compound annual growth rate or CAGR) for agriculture has been just 3.5% in the 1980s. Also, after experiencing a spurt in decadal growth during the 1980s, agricultural growth suffered relative stagnation thereafter. This is in sharp contrast to non-agricultural growth, which consistently increased from the 1980s to 2000s.

11. Which one of the following statements best reflects the corollary to the above passage?

(*a*) The benefit of economic reforms percolates down more slowly to the agriculture sector than in other sectors of the economy.

(*b*) For India, the green revolution was not as useful as it was expected to be.

(*c*) India lagged behind other countries in adapting mechanized and modern farming.

(*d*) Rural-to-urban migration resulted in the stagnant agriculture sector.

Ans: (*a*)

Option (*a*) is correct: The passage implies that economic growth and reforms benefit agriculture more slowly compared to other sectors, resulting in relative stagnation after the initial growth spurt in the 1980s.

Option (*b*) is incorrect: The passage does not specifically comment on the success or failure of the Green Revolution.

Option (*c*) is incorrect: The passage does not discuss mechanization or modernization directly.

Option (*d*) is incorrect: The passage does not mention rural-to-urban migration as a cause for stagnation in agriculture.

12. With reference to the passage, the following assumptions have been made:

The growing divergence between the fortunes of the agricultural and non-agricultural economy in India could have been reduced/contained by:

I. adapting large-scale cultivation of commercial crops and viable corporate farming.

II. providing free insurance for all crops and heavily subsidizing seeds, fertilizers, electricity and farm machinery at par with developed countries.

Which of the above assumptions is/are valid?

(*a*) I only (*b*) II only

(*c*) Both I and II (*d*) Neither I nor II

Ans: (*d*)

Assumption I is incorrect: The passage does not discuss or imply that **large-scale commercial cultivation or corporate farming** would have reduced the divergence between agricultural and non-agricultural growth.

Assumption II is incorrect: The passage does not mention **free insurance, subsidies on seeds, fertilizers, or machinery** as methods to contain the divergence, nor does it compare India's policies with developed countries.

Passage - 2

In our country, handlooms are equated with a culture that ensures a continuity of tradition. This idea has become part of the public policy-framing and provides a legitimate basis for the State to support the sector. But the notion of tradition as a single, linear entity is being strongly contested today. The narratives dominant in defining culture/tradition in a particular way are seen to have emerged as the identities and histories of large sections. The discounted and, at times, forcibly stifled identities are fighting for their rightful place in history. Against this backdrop, when we promote handloom as a traditional industry, it is not surprising that large sections of our population choose to ignore it.

13. Which one of the following statements best reflects the most logical and rational message conveyed by the author of the passage?

(*a*) We need to free the handloom industry from the limited narrative linked to preserving cultural heritage.

(*b*) Continued State support to the handloom industry ensures the preservation of some of our glorious art forms and old traditions.

(*c*) Household units of the handloom sector should be modernized and made an economically viable organized industry.

(*d*) Handloom products need to be converted to machine-made designer products so as to make them more popular.

Ans: (*a*)

Option (*a*) is correct: The passage suggests rethinking handlooms beyond just tradition and opening them up to new ideas.

Option (*b*) is incorrect: The author questions the narrow view of handlooms as merely a cultural tradition, not suggesting that state support will preserve old traditions.

Option (*c*) is incorrect: The passage does not focus on modernizing handloom units or turning them into an organized industry, but rather on changing how we view and support handlooms.

Option (*d*) is incorrect: The passage does not suggest machine-made products; it's about rethinking the tradition of handlooms, not changing their nature.

14. With reference to the above passage, the following assumptions have been made:

I. There is no need for the State to be involved in any manner in the handloom sector.

II. Handloom products are no longer appealing and attractive in the rapidly changing modern world.

Which of the above assumptions is/are valid?

(*a*) I only (*b*) II only

(*c*) Both I and II (*d*) Neither I nor II

Ans: (*d*)

Assumption I is incorrect: The passage does not suggest that **State involvement in the handloom sector should end**; rather, it critiques the **narrow cultural narrative** underpinning current support.

Assumption II is incorrect: The passage notes that some sections of the population may ignore handlooms due to the limited narrative but does **not state that handloom products themselves are unappealing or unattractive**.

15. Consider the first 100 natural numbers. How many of them are not divisible by any one of 2, 3, 5, 7 and 9?

(*a*) 20 (*b*) 21 (*c*) 22 (*d*) 23

Ans: (*c*)

Since, the numbers are not divisible by 2, 3, 5, 7 and 9.

So, the numbers can be 1 and the prime numbers between 1 to 100, excluding 2, 3, 5 and 7.

So, the required numbers are 1, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89 and 97 i.e. 22 numbers

16. If $4 \le x \le 8$ and $2 \le y \le 7$, then what is the ratio of maximum value of (x + y) to minimum value of (x – y)?

(*a*) 6 (*b*) $\frac{15}{2}$

(*c*) $-\frac{15}{2}$ (*d*) None of the above

Ans: (*d*)

The values 'x' can take are 4, 5, 6, 7 and 8

The values 'y' can take are 2, 3, 4, 5, 6 and 7

So, maximum value of (x + y) = 8 + 7 = 15

And, minimum value of (x – y) = 4 – 7 = –3

Required ratio = $\frac{15}{-3} = -5$

17. Let both p and k be prime numbers such that (p^2 + k) is also a prime number less than 30. What is the number of possible values of k?

(*a*) 4 (*b*) 5 (*c*) 6 (*d*) 7

Ans: (*b*)

The possible values of (p^2 + k) are 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29.

(p^2 + k) cannot be 2, 3 or 5.

If (p^2 + k) = 7

We can take p = 2 and k = 3

If (p^2 + k) = 11

We can take p = 2 and k = 7, p = 3 and k = 2

If (p^2 + k) = 13: No possible values of 'p' and 'k' can be obtained.

If (p^2 + k) = 17

We can take p = 2 and k = 13

If (p^2 + k) = 19: No possible values of 'p' and 'k' can be obtained.

If (p^2 + k) = 23

We can take p = 2 and k = 19

If (p^2 + k) = 29; No possible values of 'p' and 'k' can be obtained.

So, possible values of 'k' are: 3, 7, 2 and 13 and 19 i.e. 5 values

18. There are n sets of numbers each having only three positive integers with LCM equal to 1001 and HCF equal to 1. What is the value of n?

(*a*) 6 (*b*) 7

(*c*) 8 (*d*) More than 8

Ans: (*d*)

Given, LCM = 1001 and HCF = 1

We know that 1001 = 7 × 11 × 13

So, the sets can be:

(7,11,13), (1,1,1001), (1,7,143), (1,77,13), (1,11,91), (7,11,91), (11,13,77), (7, 11, 143), (1, 77, 91) and so on

19. Let PQR be a 3-digit number, PPT be a 3-digit number and PS be a 2-digit number, where P, Q, R, S, T are distinct non-zero digits. Further, PQR – PS = PPT. If Q = 3 and T < 6, then what is the number of possible values of (R, S)?

(*a*) 2 (*b*) 3

(*c*) 4 (*d*) More than 4

Ans: (*b*)

We can write, PQR – PS = PPT as follows:

100P + 10Q + R – (10P + S) = 100P + 10P + T

Or, 10Q + R – 10P – S = 10P + T

Or, 10 × 3 + R – S = 10P + 10P + T [Since, Q = 3]

Or, 30 + R – S = 20P + T

Or, R + 30 = S + T + 20P

Since, maximum value that 'R', 'S' and 'T' can take is 9

So, maximum value of R + 30 will be 39

Thus, the only possible value of 'P' will be 1

So, the equation becomes

R + 30 = S + T + 20 × 1

Or, R + 30 = S + T + 20

Or, R + 10 = S + T

Now, we are given that 'P', 'Q', 'R', 'S' and 'T' are distinct non-zero digits and T < 6

So, the values 'T' can take are 2, 4 and 5

Case 1: T = 2

R + 10 = S + 2

Or, S – R = 10 – 2 = 8

Now, the digits left are 4, 5, 6, 7, 8 and 9. But none of the two digits will end in a difference of 8.

So, this case is invalid.

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