

## ENGLISH LANGUAGE &amp; LOGICAL REASONING

## PASSAGE - I

**Lions out of the woods**

The latest population estimation exercise in Gujarat has recorded 891 lions, a 32% jump in population since 2020. In these five years, lions have also expanded their range by 17% — from 30,000 to 35,000 sq km — and now cover 58 talukas (up from 53 in 2020) in 11 districts.

While announcing the numbers on Wednesday, Gujarat Chief Minister Bhupendra Patel proudly noted that the increase in the lion population is a result not only of favourable geographic and climatic conditions but also of the state government's consistent and dedicated efforts. For this success story to continue, however, more needs to be done.

**Journey so far**

From under 200 in the 1960s when their last home in Gir was accorded special protection, Asiatic lions have made a remarkable recovery. For most parts, this journey has been slow and steady — the population did not cross the 300-mark until 1995 when the lion broke free from the safety of the forests.

Between 1990 and 2005, the lion's range doubled from 6,600 sq km to 13,000 sq km. But in those early days of breaking new ground, the expansion of lions' range resulted only in a modest 26% jump in numbers — from 284 to 359.

In the next 15 years, though, as the lion once again doubled its range from 13,000 sq km to 30,000 sq km, already established satellite populations added up to record an overall jump of 88%, from 359 to 674.

The latest estimation confirms that trajectory. However, this is only the second instance after the 2015 estimation when the population growth rate exceeded the rate of range expansion. It must also be mentioned that the absolute numbers offered without a standard error range are unusual for any scientific estimation method.

**Spreading thin**

The lions have colonised at least three new areas — Barda wildlife sanctuary, Jetpur, and Babra-Jasdan — in the last five years. A nearly 900-strong population scattered across 358 locations strengthens the species' recovery trend that made IUCN change the Asiatic lion's status from "*critically endangered*" to "*endangered*" in 2008.

A closer look at the numbers, however, shows that the population growth has not been commensurate with the expansion of the lion's range over the decades. Since 1990, the lion's range has expanded by 430%, but the corresponding jump in numbers, at 214%, has not been half as swift.

This is because the Saurashtra peninsula has very few protected wilderness areas — Gir National Park and a few small sanctuaries such as Pania, Girnar, Mitiyala and the recently colonised Barda — for the lion to flourish.

Over decades, as these sanctuaries have neared saturation, lions have reached wasteland, farmland and agricultural plantations, interspersed with clumps of natural vegetation tagged as forest patches. Even on government records, only 56% of Gujarat's 891 lions were found in forested areas.

While the relevant data is missing in the latest census, the 2020 report showed that lion population density drops from 15.2 per 100 sq km in forested areas to just 1.65 in non-forested areas.

## Stretching tolerance

Non-forest areas close to human habitations are not the ideal habitat for a large carnivore species. A former chief wildlife warden of the state acknowledged that there are “covert cases” of retaliatory killings when lions died of electrocution, “drowning in wells”, or were “shot in self-defence”.

“But unlike leopards, lions are considered Gujarat’s pride and people are generally tolerant of the species. Also, these are highly managed animals with frequent rescues, medical care and all. That makes them somewhat used to people,” he said. Familiarity, though, also means such lions are not wary of people. “It’s ecologically an unstable situation. Quite a few of the lions in human-dominated habitats are often aggressive to people, and there have been reports of unprovoked attacks,” veteran wildlife biologist Dr. Ravi Chellam told *The Indian Express*.

Social carrying capacity, argued a senior Gujarat forest official who did not want to be named, also has its limits.

“People and lions can live in harmony only when they share either space or time. People can work by the day in cropland where lions roam at night. But when they come face to face too often, it’s a dangerous test of nerves,” Chellam said.

For now, a combination of awareness campaigns, media sensitisation and timely compensation for livestock losses is keeping peace. What has also helped is the relative availability of wild prey such as boars, outside forested areas due to limited hunting for bushmeat in the state.

But many lions are also dependent on livestock, including those that they do not have to hunt. “Very frequently, these lions are feeding on dumped livestock carcasses that also attract village dogs. This makes these lions vulnerable to disease infections,” Dr Chellam cautioned.

## Future of the pride

It’s been 12 years since the Supreme Court set a six-month deadline for shifting lions from Gujarat to Madhya Pradesh, and seven years since Gujarat assured the apex court that this order would be implemented.

In September 2020, the initial proposal under Project Lion, launched by Prime Minister Narendra Modi on August 15 that year, identified seven sites, including three each in Madhya Pradesh and Rajasthan, for relocation.

Then, in July 2022, the government told the Lok Sabha that the scope of assessing the suitability of a new habitat for lions was limited to potential sites only within Gujarat.

On their own, lions have recently reached one of those sites — Barda wildlife sanctuary. But the sanctuary’s less than 200 sq km expanse can accommodate only a few animals.

As potential targets of doubling the lion population to 2,000 are being tossed around, the Asiatic lion needs quality forest habitats away from human settlements to safeguard against potential conflict and epidemic breakouts.

## The population of lions in Gujarat has grown rapidly over the past decade

Region / Sanctuary	2015	2020	2025
Gir NP, Pania WLS & surroundings	315	344	394
Girnar WLS	33	56	54
Mitiyala WLS	8	16	32
Savarkundla WLS, Liliya & surroundings	80	98	125
Bhavnagar mainland	37	56	103
South-eastern coast	18	67	94
South-western coast	32	20	25
Bhavnagar coast	0	17	15
Barda WLS	0	0	17
Jetpur	0	0	6
Babra-Jasdan	0	0	4
Corridors	0	0	22
<b>Total</b>	<b>523</b>	<b>674</b>	<b>891</b>

NP: National Park; WLS: Wildlife Sanctuary

Source: Gujarat Forest Department

1. Which of the following BEST explains why the Asiatic lion population grew slowly between 1990 and 2005, despite their geographic range doubling during that period?
- A. The lions depended mostly on livestock, limiting population expansion.
  - B. Habitat expansion occurred in poor-quality non-forested areas that could not support large population growth.
  - C. Conservation policies during the period restricted breeding.
  - D. Human-lion conflict increased, causing higher mortality.
2. Which of the following statements can be inferred about Gujarat's lion conservation approach?
- A. The state prioritises relocation over local population management.
  - B. The state's approach depends mainly on natural prey availability and minimal human intervention.
  - C. Gujarat's strategy combines active management (rescues, medical care) with reliance on local community tolerance.
  - D. Conservation is carried out exclusively within protected areas.
3. In the passage, the author notes that familiarity between lions and humans creates an "ecologically unstable situation." Which of the following BEST captures the meaning of this phrase?
- A. Human settlements provide excessive food, altering the lions' diet.
  - B. Increased proximity reduces the lions' fear of humans, increasing risks of aggression.
  - C. Human presence distracts lions from hunting natural prey.
  - D. Lions become dependent on agricultural areas for survival.
4. Why does the author consider the lack of standard error margins in the lion census "unusual for any scientific estimation method"?
- A. Because lions are difficult to count without satellite technology.
  - B. Because statistical estimates usually include measures of uncertainty.
  - C. Because previous censuses always included exact numbers.
  - D. Because the sample size in Gujarat is too large for errors to occur.
5. Which of the following BEST reflects the author's central concern regarding the future of Asiatic lions?
- A. Lions must be relocated quickly before their population declines.
  - B. Habitat quality and space limitations threaten long-term population sustainability.
  - C. Local communities have become hostile to the presence of lions.
  - D. Gujarat should halt further expansion of lion territories.
6. The passage states that lion range expanded by 430% since 1990, while the population grew by only 214%. Which of the following conclusions is MOST strongly supported by this information?
- A. Lions disperse faster than they reproduce.
  - B. Habitat expansion alone is insufficient to ensure proportional population growth.
  - C. Lions reproduce slower in forested habitats.
  - D. The census incorrectly measured the population.
7. Which of the following, if true, would MOST strengthen the argument that non-forest areas are ecologically unsuitable for long-term lion conservation?
- A. Non-forest areas contain high livestock density.
  - B. Lions in non-forest areas engage in conflict with leopards.
  - C. Lion mortality due to electrocution and accidental drowning is significantly higher in non-forest areas.
  - D. Non-forest areas have fewer human visitors.
8. The author argues that the presence of lions in human-dominated landscapes creates a risk of "unprovoked attacks." Which assumption does this argument rely on?
- A. Lions are inherently aggressive animals.
  - B. Lions' behaviour changes when exposed frequently to people.

C. Humans often ignore safety protocols in lion habitats.

D. Non-forest areas lack proper prey diversity.

9. Which of the following, if true, would MOST weaken Gujarat's claim that internal management alone is sufficient and relocation is unnecessary?

A. Barda wildlife sanctuary can only accommodate a few lions due to its small size.

B. Wild boar populations are increasing outside forest areas.

C. Human tolerance for lions has declined in some villages.

D. Another state demonstrates successful relocation and establishment of a stable lion population.

10. The state government argues that increased lion numbers are proof of successful conservation. Which of the following counter-arguments aligns MOST closely with the author's concerns?

A. Population growth without sufficient high-quality habitat may create future conflict and disease vulnerabilities.

B. Population growth is irrelevant unless genetic diversity increases.

C. Population growth should be limited through artificial birth control.

D. Lion populations can sustain themselves without forest habitats.



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## LEGAL REASONING

### PASSAGE - I

The Consumer Protection Act, 2019 has recently replaced the three decade old Consumer Protection Act, 1986. The Act allows consumers to file their complaint with the court from anywhere. This comes as a big relief as earlier they were required to file complaints in the area where the seller or service provider was located. This is a fitting move considering the rise in e-commerce purchases, where the seller could be located anywhere. In addition, the Act also enables the consumer to seek a hearing through video conferencing, saving him both money and time.

The Act has proposed provisions for product liability under which a manufacturer or a service provider has to compensate a consumer if their goods/service cause injury or loss to the consumer due to manufacturing defect or poor service. For instance, if a pressure cooker explodes due to a manufacturing defect and harms the consumer, the manufacturer is liable to compensate the consumer for the injury. Earlier, the consumer would only be compensated with the cooker's cost. The consumer could ask for compensation, but through a civil court, which usually takes years to resolve a case, and not consumer forum.

The most significant impact of this provision will be on e-commerce platforms as it also includes service providers under its ambit. "Product liability is now extended to service providers and sellers along with manufacturers. This means e-commerce sites cannot escape as aggregators anymore."

E-commerce will now be governed by all the laws that apply to direct selling. The guidelines propose that platforms like Amazon, Flipkart, Snapdeal etc will have to disclose sellers' details, such as their address, website, email, etc and other conditions related to refund, exchange, terms of contract and warranty on their website to increase transparency.

The onus of ensuring that no counterfeit products are sold on these platforms will also most likely lie with the companies. If any such product is reported or recognised, the company could be penalised. This move is fitting since cases of fake products sold through e-commerce platforms are rampant.

**11. Abhi ordered a mobile phone on Amazon. The delivery package came with a dummy phone that never worked. Abhi called the customer service to report the event but they said the responsibility lies with the delivery guy. Enraged by this behaviour he filed a complaint against Amazon for violation of consumer rights. Is Amazon liable? Decide.**

- (a) No, Amazon is merely the platform for other sellers who pack and deliver the goods.
- (b) No, Amazon is an aggregator and not a real seller.
- (c) Yes, platforms are liable for delivery violations on behalf of their sellers.
- (d) Yes, Consumers always have an upper hand.

**12. Naman from Surat ordered banarasi silk sarees from Varanasi Handloom over Amazon. The sarees when delivered were torn. He called the seller and was told that they cannot replace the sarees. Can Naman file a case against the sellers in Surat? Decide.**

- (a) No, he has to file it in Varanasi where the seller is based.
- (b) No, he has to file it in San Francisco where Amazon is based.
- (c) No, no one is liable as the sarees got damaged during transit.
- (d) Yes, he can file the case against the sellers in Surat.

**13. Krish bought open milk from a nearby milk seller. The milk seller does not package his milk or has certification from the authorities. People trust him because his shop has been there for 2 decades. Krish fed the milk to his 2 children who were then taken ill. Doctors later revealed that food poisoning was the cause of their sickness. Can Krish sue the milk seller? Decide.**

- (a) No, the milk seller never claimed his products to be safe.
- (b) No, local establishments are beyond the scope of laws.
- (c) No, food officers are liable for not being vigilant.



(d) Yes, safe service is a responsibility of the seller.

**14. COVID-19 has spread across the country. N-95 masks and Hand sanitizers have become essential for use to protect oneself against the disease. The medical supplies sellers have seen a huge boost in their sales. Karim has been selling the masks by a profit margin of 15%. He sees the desperation of buyers and decides to sell at a margin of 20% which was now above the MRP. Ramesh while buying the masks notices the discrepancy and complains to Karim. Karim tells him he is free to not buy if he doesn't agree with the price. Ramesh decides to not buy the masks. Can Ramesh sue Karim for violation? Decide.**

- (a) No, Ramesh is not a consumer as he did not buy the product.
- (b) No, during pandemic prices can rise and selling above MRP is justified.
- (c) Yes, selling above MRP is a violation of consumer rights.
- (d) Both (a) & (b).

**15. Shrey ordered a mobile phone on Amazon. The delivery package came with a dummy phone that never worked. Shrey called the customer service to report the event but they said the responsibility lies with the delivery guy. Shrey filed a complaint at the consumer forum in his home state. Amazon filed an affidavit stating that the case should be transferred to the seller's home state as the jurisdiction lies there. Can Shrey call for hearing through video conferencing? Decide.**

- (a) No, the case has to be heard at the convenience of the seller.
- (b) No, the essence of dispute resolution is lost during video conferences.
- (c) Yes, this will eliminate the hassle of travelling for the seller.
- (d) Both (a) & (b).

### Passage-II

An act will be called insider trading if such information is provided to a third party who benefits from his investment activities post receiving such information. It is a term used commonly in the securities market and usually relates to illegal conduct. However, insider trading can be both legal and illegal. In generic terms, insider trading means buying and selling of stocks and shares based on significant information which is publicly not available. Apart from creating a biased field which disadvantages other investors, insider trading by corporate employees breach their utmost responsibility to work in the best interest of the shareholders.

The legality of insider trading depends on the time when the insider's official trades the information. Analysing a global perspective, in most countries, insider trading is not illegal if the information provided by key personnel of a company in a way which does not allow an individual to take advantage of insider information. Importantly, the higher officials of a company are not restricted to trade in their company's shares as contrary to the general rules; it would be unfair to prevent these officials making company's significant decision from investing in stocks. Not only directors can be convicted under such an offence, but the law can also penalize the brokers as well as the family members to misuse the information.

The term 'insider' has been defined under Regulation 2(e) of SEBI (Prohibition of Insider Trading) Regulations, 1992. Basically, the term 'insider' can be classified into three broad categories, which are: Persons who are connected to the company, Persons who are connected with the company, Persons who are deemed to be connected to the company. In order to become an insider a person has to fulfil three elements, viz; The person should be a natural person or legal entity; The person should be a connected person or deemed to be connected; Acquisition of the unpublished price sensitive information by virtue of such connection. Unpublished price sensitive information means any information which refers to the internal matters of the company and ordinarily it is not disclosed by the company in the regular course of the business. In India, SEBI (Insider Trading) Regulation, 1992 framed under Section 11 of the SEBI Act, 1992 intends to curb and prevent the menace of insider trading in securities. Section 15(G)(i) of SEBI act 2002 says, if an insider either on its own or on behalf of any person has dealt on behalf of his company any unpublished information then he may be fined with RS. 25 crores or 3 times the profit made, whichever is higher.

**16. There was a company named Manas Ltd., involved in Telecom business. Manas Ltd. had a manager named Kriti, her work involved communicating with investors, bankers, other companies, etc. Recently, Manas Ltd got an offer from Agrawal Ltd for a merger, which was beneficial for both the companies. It was decided that this merger would be kept confidential for some time, CEOs of both the company and Kriti knew of this merger as of now. After a week, Manas Ltd issued a prospectus issuing shares next month and it was also decided that information about the merger would be made public after the allotment of the shares. Meanwhile, Kriti accidentally talks about the merger to her friend Rachna and how this will make buying of shares more beneficial, who relies on this and buys shares worth Rs 10,00,000 of Manas Ltd. Later, the merger does not happen and therefore, Rachna does not benefit anything from buying the share. Can this be termed as insider trading? Should Kriti be held liable for this. Choose the option based on the based -**

- (a) Yes, because Kriti fulfils all the criteria to be an insider and provided with sensitive non- public information to Rachna. Thus, SHOULD
- (b) No because Kriti gave the information accidentally which shows there was no intention on her side and thus not liable.
- (c) No because Rachna did not benefit from buying the shares post receiving the information.
- (d) Yes, because non- public information was released which would have benefitted Rachna had the merger happened. Thus, the actual benefit is irrelevant and Kriti is liable.

**17. Now assume that the merger did happen and Rachna gained on her investment made relying on his. Is this insider trading- Will your answer change from above and why?**

- (a) Yes, now it is insider trading because Rachna has benefitted from the information.
- (b) No because in both the cases it was insider trading, the benefit is irrelevant the information should be sensitive and non-public.
- (c) No, in both the cases the information was released accidentally and lacks the requisite intention.
- (d) Yes, because earlier the merger did not happen and thus the information was incorrect. Now the merger makes the information correct and sensitive. Thus, amounting to inside trading.

**18. There was a company named Wadhwa, primarily involved in the Banking sector. Recently, Wadhwa decided to start the business of manufacturing and selling cement. This was a profitable business which would boost the profits of the company, thus increasing the demand for its share. It was decided that this would be kept confidential for the time being. All the preparations of new business were carried out by Mr. Aaroohi, the general manager of Wadhwa. However, Mr. Aaroohi was the least trusted employee and was fired fearing he would reveal this to others, but he had no intention to do so. On being fired, Mr. Aaroohi to take revenge told this to the rival bank Sanyukta Fauzdar, who took advantage of this information and themselves started the business of manufacturing and selling cement before Wadhwa and earned huge profits. Can Mr. Aaroohi be termed as an insider? Answer based on the three elements -**

- (a) Yes, because he fulfils all the three elements.
- (b) No, because he does not fulfil the three elements.
- (c) Yes, because he provided a third party who benefits from his investment activities post receiving such information.
- (d) No because Aaroohi has left the job and is no longer connected to the company.

**19. In the given fact can this be termed as insider trading. Which among the following is correct based on the above passage -**

- (a) No, because Aaroohi is not an insider.
- (b) Yes, because Sanyukta Fauzdar benefitted from the sensitive information provided by Mr. Aaroohi.
- (c) No because insider trading is limited to the securities market only.
- (d) No because for insider trading the investment must be made in the same company whose information is being traded and that results in an unfair benefit.

**20. Suppose that Aaroohi is not fired and while working there informs her friend Meghana at Sanyukta Fauzdar Company about Wadhwa's new business. Meghana immediately invests in Wadhwa. After one day, Wadhwa makes the information public. Now, when the cement manufacturing business starts, the company earns lots of profit and its share price rises. Meghana also earns a huge return on this. Will this amount to insider trading -**

- (a) Yes, because Meghana is unfairly benefitted from investing based on the information.
- (b) No because the information was no longer sensitive and was public knowledge.
- (c) No, because Aaroohi is not an insider.
- (d) Yes, but in this situation insider trading is legal.

## GENERAL KNOWLEDGE

### Passage-I

The greenhouse effect is a natural atmospheric phenomenon essential for maintaining Earth's temperature within a habitable range. It occurs when certain gases in the atmosphere absorb infrared radiation from the Earth's surface and re-emit it, thereby preventing heat from escaping into space. Without the greenhouse effect, Earth's average temperature would be around  $-18^{\circ}\text{C}$  instead of  $+15^{\circ}\text{C}$ . However, human-induced or anthropogenic intensification of this effect has led to accelerated global warming and climate instability.

The major greenhouse gases (GHGs) include water vapor, carbon dioxide ( $\text{CO}_2$ ), methane ( $\text{CH}_4$ ), nitrous oxide ( $\text{N}_2\text{O}$ ), ozone ( $\text{O}_3$ ), and synthetic gases such as chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ( $\text{SF}_6$ ). Each gas differs in its global warming potential (GWP) and atmospheric lifetime. For example, methane has a GWP nearly 28–34 times higher than  $\text{CO}_2$  over a 100-year period, while  $\text{SF}_6$  has a GWP more than 23,000 times higher and a lifetime extending over millennia.  $\text{CO}_2$ , the most abundant anthropogenic GHG, is primarily emitted through fossil fuel combustion, industrial processes, and deforestation.

Water vapor is the most abundant greenhouse gas but operates primarily as a feedback mechanism rather than a direct anthropogenic emission. Its concentration rises when temperatures increase, amplifying warming. Methane originates from livestock, rice paddies, landfills, and fossil fuel extraction. Nitrous oxide emissions are driven by nitrogen-based fertilizers, biomass burning, and industrial chemicals. Ozone acts as a greenhouse gas in the troposphere, but in the stratosphere, it protects against ultraviolet radiation.

Synthetic fluorinated gases used in refrigeration and industry have exceptionally high GWP. The Montreal Protocol successfully phased out CFCs, but their substitutes—HFCs—while ozone-safe, remain potent greenhouse gases, leading to the Kigali Amendment to reduce their use.

The greenhouse effect is closely linked to radiative forcing, a measure of how much a factor influences Earth's energy balance. Increased GHG levels exert positive radiative forcing, warming the planet. Land-use changes, aerosols, and black carbon also affect this balance.

Evidence of anthropogenic intensification includes rising global temperatures, ocean heat content, melting glaciers, declining Arctic sea ice, and increased frequency of extreme events. Climate models confirm that without human-induced emissions, the observed warming trend cannot be explained.

Mitigation strategies include transitioning to renewable energy, enhancing energy efficiency, promoting carbon sequestration, reducing methane emissions from agriculture, and adopting sustainable land-use practices. Carbon pricing, emission trading schemes, and climate finance mechanisms are essential global tools. Adaptation measures involve climate-resilient agriculture, urban heat management, improved water governance, and early warning systems.

Understanding the greenhouse effect and the roles of various GHGs is crucial for effective climate policy. As countries move toward net-zero pathways, balancing development and emissions remains a central challenge in global climate governance.

### 21. Consider the following statements regarding the natural greenhouse effect:

1. It keeps the Earth's average temperature above the freezing point of water.
2. Without it, Earth's average temperature would be around  $-18^{\circ}\text{C}$ .
3. Water vapor contributes the largest share to the natural greenhouse effect.

Which of the above statements are correct?

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



**22. Which of the following statements about methane (CH<sub>4</sub>) are correct?**

1. It has a higher global warming potential (GWP) than CO<sub>2</sub>.
2. It has an atmospheric lifetime of about 10–12 years.
3. Wetlands are the largest natural source of methane.

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

**23. Regarding nitrous oxide (N<sub>2</sub>O), consider the following:**

1. It is primarily emitted from agricultural soil management.
2. Its global warming potential is higher than methane.
3. It also acts as an ozone-depleting substance.

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

**24. Which of the following is/are correct about “radiative forcing”?**

1. Positive radiative forcing leads to warming of the Earth.
2. Aerosols always cause positive radiative forcing.
3. Greenhouse gases produce positive radiative forcing.

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

**25. Consider the following gases:**

1. CO<sub>2</sub>
2. CH<sub>4</sub>
3. SF<sub>6</sub>
4. H<sub>2</sub>O

Which of the above gases are considered anthropogenic greenhouse gases?

A. 1 and 3 only      B. 1, 2 and 3 only      C. 2, 3 and 4 only      D. 1, 2 and 4 only

**26. With reference to ozone (O<sub>3</sub>), consider the following:**

1. Tropospheric ozone acts as an air pollutant and greenhouse gas.
2. Stratospheric ozone protects the Earth from ultraviolet radiation.
3. Ozone has the same radiative impact irrespective of altitude.

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

**27. Which of the following gases has the highest atmospheric lifetime?**

A. CO<sub>2</sub>      B. N<sub>2</sub>O      C. PFCs      D. SF<sub>6</sub>

**28. Consider the following statements about synthetic greenhouse gases:**

1. SF<sub>6</sub> is used in heavy electrical equipment.
2. HFCs do not deplete ozone but have high GWP.
3. PFCs have extremely long atmospheric lifetimes.

Which are correct?

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

**29. Which of the following sources contribute significantly to anthropogenic CO<sub>2</sub> emissions?**

1. Cement production
2. Deforestation
3. Aircraft condensation trails

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

**30. Consider the following statements about climate feedback mechanisms:**

1. Water vapor feedback strengthens global warming.
2. Ice-albedo feedback is a negative feedback.
3. Cloud feedback can be both positive and negative.

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

**PASSAGE - II**

The Launch Vehicle Mark-3 (LVM3), earlier known as the Geosynchronous Satellite Launch Vehicle Mark-III (GSLV Mk-III), is India's heaviest operational launch vehicle and represents a transformational leap in the country's space capabilities. Developed by the Indian Space Research Organisation (ISRO), LVM3 is designed to carry heavier communication satellites into Geostationary Transfer Orbit (GTO) and large spacecraft for deep-space missions. With a lift-off mass of approximately 640 tonnes and a payload capability of 4 tonnes to GTO and 8 tonnes to Low Earth Orbit (LEO), the rocket positions India among nations capable of independently executing heavy-lift missions.

LVM3's major breakthrough lies in its C25 upper stage powered by the CE-20 cryogenic engine, the most powerful cryogenic engine ISRO has ever built. The cryogenic stage provides high efficiency and enables India to reduce its dependence on foreign launchers such as Ariane-5 for heavy communication satellites. This indigenization is strategically important given the increasing demand for high-throughput satellites under programmes like BharatNet and digital expansion.

Structurally, LVM3 is a three-stage rocket: twin S200 solid boosters, the L110 liquid core stage, and the C25 cryogenic stage. The solid boosters are among the largest of their kind globally and provide the initial thrust required to lift the heavy vehicle. The core stage utilizes liquid propellants for controlled ascent, while the cryogenic stage ensures precision orbital insertion. This combination makes LVM3 ISRO's most reliable vehicle for human spaceflight under the Gaganyaan mission, where safety and performance margins must exceed standard launch requirements.

LVM3 gained international recognition after successfully launching Chandrayaan-2 in 2019, and later, it was selected as India's preferred rocket for missions involving large satellites, space telescopes, and potentially interplanetary probes. Its ability to deliver crew modules to LEO also makes it central to India's plans for constructing an indigenous space station by 2035.

Beyond scientific missions, LVM3 has emerged as an attractive option for commercial launches. The successful deployment of 36 OneWeb satellites in 2022 and 2023 demonstrated its capability in large LEO constellation launches. This positioned India as a competitive player in the global satellite launch market, particularly at a time when geopolitical tensions and shortage of heavy-lift vehicles such as Russia's Proton and Europe's Ariane-5 retirement caused market realignments.

India's ongoing development of the Next-Generation Launch Vehicle (NGLV) aims to eventually supersede LVM3. However, until NGLV becomes operational, LVM3 will remain India's flagship heavy-lift vehicle, enabling missions spanning lunar exploration, Earth observation, high-speed communication, defence payload deployment, and human spaceflight.

In essence, LVM3 symbolizes India's technological maturity, strategic autonomy, and ambition in the space domain. Its design, versatility, and reliability have placed India among the world's leading space powers, supporting both national development and global commercial partnerships.

**31. With reference to LVM3, consider the following statements:**

1. LVM3 uses the CE-20 engine in its upper stage.
2. LVM3 can carry more than 10 tonnes to Low Earth Orbit.
3. LVM3 uses two solid boosters for its initial thrust.

Which of the above statements is/are correct?

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

**32. Consider the following pairs:**

**Mission – Role of LVM3**

1. Chandrayaan-2 – Launched using LVM3
2. OneWeb Satellites – Launched using LVM3
3. Mars Orbiter Mission – Launched using LVM3

How many pairs are correctly matched?

- A. Only one      B. Only two      C. All three      D. None

**33. Which of the following stages of LVM3 uses liquid propellants?**

- A. S200      B. L110      C. C25      D. Both B and C

**34. The CE-20 engine used in LVM3's upper stage belongs to which category of engines?**

- A. Semi-cryogenic      B. Cryogenic      C. Hypergolic      D. Solid-fuel

**35. Why is LVM3 crucial for the Gaganyaan mission?**

- A. It is India's only fully reusable launch vehicle.      B. It has proven capability for safe crew module delivery to LEO.  
C. It is the world's heaviest operational rocket.      D. It is designed exclusively for human spaceflight.

**36. Which of the following is NOT a function of LVM3 as per the passage?**

- A. Launching heavy communication satellites      B. Supporting human spaceflight  
C. Deploying deep-sea research modules      D. Enabling commercial launches

**37. In the context of LVM3, OneWeb mission demonstrated India's capability in:**

- A. Solar-powered satellite launches      B. Mega constellation deployment  
C. Reusable booster recovery      D. Static engine testing technology

**38. Which of the following best describes India's strategic advantage gained through LVM3?**

- A. Eliminating dependence on foreign heavy-lift launchers      B. Achieving hypersonic flight capability  
C. Ability to manufacture private spacecraft      D. Complete digitization of space operations

**39. Which of the following components of LVM3 is the largest of its kind globally?**

- A. L110      B. C25      C. S200      D. CE-20

**40. LVM3 is expected to remain India's flagship heavy-lift vehicle until the operationalization of:**

- A. SSLV      B. PSLV-XL      C. NGLV      D. RLV-TD

## Quantitative Technique

### Passage-I

In a city, there are three coffee shops 'P', 'Q', and 'R' that sell three types of coffee: 'Espresso', 'Cappuccino', and 'Latte'. Number of 'Cappuccino' cups sold by 'R' is 90. The ratio of the number of 'Espresso' cups sold by shop 'P' to 'Q' is 4:7. The number of 'Latte' cups sold by shop 'R' is 20% more than the number of 'Espresso' cups sold by shop 'Q'. The ratio of the number of 'Latte' cups sold by shop 'R' to shop 'Q' is 3:1. The number of 'Latte' cups sold by shop 'P' is 150. The number of 'Espresso' cups sold by shop 'P' is 60% more than the number of 'Latte' cups sold by shop 'P'. The total number of 'Espresso' cups sold by all three shops together is 1100. The total number of 'Cappuccino' cups sold by all three shops together is the average of the total number of 'Espresso' and 'Latte' cups sold by all three shops together. The ratio of the number of 'Espresso' cups sold by shop 'R' to the number of 'Cappuccino' cups sold by 'Q' is 4:7.

**41. Number of 'Cappuccino' cups sold by Shop 'Q' is how much more/less than the number of 'Espresso' cups sold by Shop 'P' and 'R' together?**

- (A) 90 (B) 95 (C) 86 (D) 77

**42. Number of 'Latte' cups sold by Shop 'Q' is what percent more than of number of 'Cappuccino' cups sold by Shop 'P'?**

- (A) 60% (B) 70% (C) 66% (D) 56%

**43. How many 'Cappuccino' cup sold by shop P.?**

- (A) 101 (B) 123 (C) 134 (D) 155

**44. Find out the total number of coffee cups (all the three type) sold by shop Q.**

- (A) 1235 (B) 1345 (C) 1765 (D) 1358

**45. Find the ratio of the number of 'Cappuccino' cups sold by shop R to the latte cups sold by shop P.**

- (A) 3:5 (B) 5:3 (C) 5:9 (D) 1:2

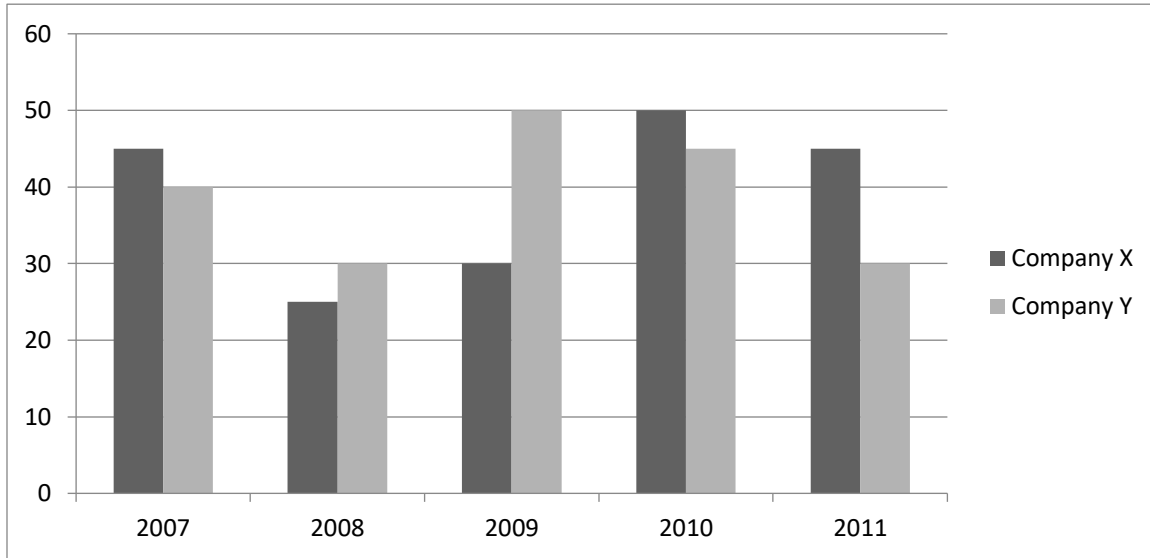
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### Passage - II

The bar graph shows percent profit of two company X and Y over 5 years:



46. In the year 2009 , the expenditure of company X was Rs 40 lakh, find the total profit of company X in that year?

- (A) 12 lakh (B) 33 lakh (C) 14 lakh (D) 32 lakh

47. Find the average % profit of company Y in all the year together?

- (A) 25% (B) 45% (C) 39% (D) 30 %

48. In 2007 the income of company Y was Rs. 42 lakh, find the value of expenditure of company Y in that year?

- (A) 45 lakh (B) 30 lakh (C) 40 lakh (D) 53 lakh

49. In which of the following year company X earned maximum profit?

- (A) 2007 (B) 2008 (C) 2010 (D) CND

50. The profit of company Y in the year 2011 was Rs . 45 lakh, what was the income of company Y in the year 2008?

- (A) 27 lakh (B) 67 lakh (C) 30 lakh (D) CND