

Q: Consider the following:

1. Callisto
2. Europa
3. Enceladus

Which among the following is/are the moons of Jupiter?

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

Ans: a

Explanation:

- The JUPITER ICy Moons Explorer (JUICE) mission will launch to the biggest planet in the solar system in search of signs of life on its three biggest moons.
- The spacecraft will observe Jupiter and its three largest moons: Callisto, Europa, and, in particular, Ganymede.
- The moon's buried oceans could tell whether life can arise in different environments across the cosmos.
- The objective is to explore the moons for habitability and to explore if it is possible to live around giants.
- The spacecraft will characterise the oceans, icy shells, compositions, surfaces, environments, and activity of Ganymede, Europa, and Callisto and the wider Jupiter system, characterising Jupiter's atmosphere, magnetic environment, ring system, and other satellites.
- After its first arrival in the Jovian system, the spacecraft will go on to spend many months orbiting Jupiter, completing fly-bys of Europa, Ganymede, and Callisto, and finally conducting an orbital tour of Ganymede.

Q: Which of the following are the missions to Jupiter?

1. Cluster II
2. Juice
3. Pioneer 10

Choose the correct answer using the codes given below:

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

Ans: b

Explanation:

- Juice is a Jupiter exploration mission of European Space Agency. It will make detailed observations of the giant gas planet and its three large ocean-bearing moons - Ganymede, Callisto and Europa. Juice has been constructed by an industrial consortium led by Airbus Defence and Space.
- Pioneer 10 is a NASA space probe launched in 1972 that completed the first mission to the planet Jupiter. It was NASA's first mission to the outer planets. It is the first spacecraft to traverse the asteroid belt and fly by (close approach of a spacecraft to a planet or moon for observation) Jupiter.
- Cluster II is a space mission of the European Space Agency, with NASA participation, to study the Earth's magnetosphere.

Q: Consider the following statement regarding Promissory estoppel:

1. It is a concept developed in contractual laws.
2. *Chhaganlal Keshavalal Mehta v. Patel Narandas Haribhai* is related to it

Choose the correct option from the codes given below:

- a) 1 Only
- b) 2 Only
- c) 1 and 2
- d) None of the above

Ans: c

Explanation:

- Promissory estoppel is a concept developed in contractual laws.
- A valid contract under law requires an agreement to be made with sufficient consideration.
- A claim of doctrine of promissory estoppel essentially prevents a "promisor" from backing out of an agreement on the grounds that there is no "consideration."

- The **doctrine is invoked in court by a plaintiff** (the party moving court in a civil action) against the defendant to ensure execution of a contract or seek compensation for failure to perform the contract.
- In a 1981 decision in *Chhaganlal Keshavalal Mehta v. Patel Narandas Haribhai*, the SC lists out a checklist for when the doctrine can be applied:
 - ❖ First, there must be a clear and unambiguous promise.
 - ❖ Second, the plaintiff must have acted relying reasonably on that promise.
 - ❖ Third, the plaintiff must have suffered a loss.

Q: Currently, the engineers are warming up the Large Hadron Collider (LHC). Consider the following statements with respect to Large Hadron Collider (LHC):

1. It is the world's most powerful particle accelerator and aims to understand the fundamental structure of matter.
2. A hadron is a subatomic particle made up made of two or more quarks held together by the strong interaction.
3. It is built by the European Organization for Nuclear Research (CERN).

Which of the statement(s) is/are correct?

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

Ans: d

Explanation:

- The **Large Hadron Collider (LHC)**, built by the European Organization for Nuclear Research (CERN), is on the energy frontier of physics research, conducting experiments with highly energised subatomic particles.
- The LHC, is the world's largest science experiment.
- It is a collider that accelerates two beams of particles in opposite directions and smashes them head on. These particles are hadrons.
- The tunnel is circular and is located below ground on the border between France and Switzerland.
- The LHC ran its first test operation on September 10, 2008.
- One goal of the LHC project is to understand the fundamental structure of matter by re-creating the extreme conditions that occurred in the first few moments of the universe according to the big-bang model.
- A hadron is a **subatomic particle made up of smaller particles**. The LHC typically **uses protons**, which are **made up of quarks and gluons**.

Q: Consider the following statement:

1. The Northeast Frontier (Assam) Tribal and Excluded Areas Sub-Committee in 1947 was chaired by G.N. Bordoloi.
2. Advisory Committee on the Subject of Political Safeguards for Minorities in 1949 was chaired by Ambedkar.

Choose the correct option from the codes given below:

- a) 1 Only
- b) 2 Only
- c) 1 and 2
- d) None of the above

Ans: a

Explanation:

The Northeast Frontier (Assam) Tribal and Excluded Areas Sub-Committee (July 28, 1947):

- **Chaired by G.N. Bordoloi**, covered the Naga, Khasi, Garo, Jaintia and Mikir Hills and collected a reservoir of people's lived experiences and demands, beliefs and customs.

Advisory Committee on the Subject of Political Safeguards for Minorities (May 11, 1949):

- **Chaired by Sardar Patel**, it looked at the abolition of reservations for religious minorities.