



UPSC CURRENT AFFAIRS MCQS 02-12-2023

1. Consider the following statements regarding Exit Polls:

1. It is conducted after the completion of the voting process.
2. Only State run media is permitted to conduct Exit Polls.
3. The Election Commission has no powers with respect to Exit Polls.

How many of the above statements is/are correct?

- (A) Only one
- (B) Only two
- (C) All three
- (D) None

Answer: (B)

Explanation: Recently the exit polls were conducted in the 5 states such as Telangana, Madhya Pradesh, Rajasthan, Mizoram, and Chhattisgarh for the state assembly elections. An opinion poll is a pre-election survey to gather voters' views on a range of election-related issues. An exit poll is a post-election survey that is conducted immediately after people have voted and assesses the support for political parties and their candidates. It is conducted by various survey agencies.

The first exit poll in India was conducted in 1957 during the second Lok Sabha elections by the Indian Institute of Public Opinion. Exit poll results are very useful to the media to fill a bit of airtime before the announcement of the results. A well-run exit poll can be extremely accurate. In February 2010, restrictions were imposed only on exit polls through the introduction of Section 126(A) in the RPA. Election Commission has powers to regulate Exit Polls. Hence, statement 3 is not correct.

2. Consider the following statements, with reference to Piezoelectricity:

1. It is the process of using crystals to convert mechanical energy into electrical energy or vice versa.
2. Bone and tendons have the capacity to support Piezoelectricity.

Which of the above statements is/are correct?

- (A) 1 only
- (B) 2 only
- (C) Both 1 and 2
- (D) Neither 1 nor 2

Answer: (C)

Explanation: Piezoelectricity was discovered in 1880 by Pierre and Paul-Jacques Curie. Piezoelectricity is a phenomenon in which certain materials can generate an electric charge in response to mechanical stress. The certain materials include quartz, ceramics such as lead zirconate titanate (PZT) and even certain biological substances like bone and the tendons. Usually, the charges on atoms in the molecules that make them up are symmetric on two sides of an axis. But in certain materials when some stress is applied, the molecule becomes distorted and the asymmetry of charges gives rise to a small electric current. Some materials also display an inverse piezoelectric effect, where the application of an electric current induces a mechanical deformation. A piezoelectric crystal is placed between two metal plates. At this point, the material is in perfect balance and does not conduct an electric current. Mechanical pressure is then applied to the material by the metal plates, which forces the electric charges within the crystal out of balance. Excess negative and positive charges appear on opposite sides of the crystal face. The metal plate collects these charges, which can be used to produce a voltage and send an electrical current through a circuit. Both direct and inverse piezoelectric materials are widely used in pressure sensors, accelerometers, and acoustic devices, where their ability to convert mechanical signals into electrical signals is crucial. The piezoelectric effect is also what made quartz watches so common and over time, affordable. Hence, both statements are correct.

3. Orbital Resonance, sometimes seen in the news, is related to which of the following statements?

- (A) A phenomenon that occurs when an object or system is subjected to an external force or vibration that matches its natural frequency.
- (B) It is any system of two or more satellites orbiting the same primary and whose orbital mean motions are in a ratio of small whole numbers.

- (C) A way of describing the bonding in certain molecules and polyatomic ions.
- (D) It is the time it takes for an object to return to the same point in its orbit.

Answer: (B)

Explanation: Orbital Resonance is any system of two or more satellites (including planets) orbiting the same primary and whose orbital mean motions are in a ratio of small whole numbers.

Astronomers have discovered an exceptionally rare phenomenon in a nearby star system where 6 planets that orbit their central star in sync with a rhythm. The six planets orbit a star called HD110067, which is about 100 light-years away from the Earth in the northern constellation of Coma Berenices. In this particular case, the planet closest to the star makes three orbits for every two of the next planet. This is called a $3/2$ resonance and is repeated among the four closest planets. Multi-planet systems may be common in our galaxy, but ones in a tight gravitational formation known as “resonance” are rarely observed. Among the two outermost ones, a $4/3$ resonance pattern was identified, meaning that one takes four orbits for every three of the outermost one. Hence, statement (b) is correct.

4. Consider the following passage:

It is a medieval fort located on the Arabian Sea off the coast of Maharashtra in western India. Chhatrapati Shivaji Maharaj of the Maratha Empire erected the fort. It covers 48 acres and has reinforced walls that are 29 feet high and 12 feet thick, stretching over two miles. A slab within the fort bears the Maratha King's handprint and footprint.

The above-mentioned passage refers to which one of the following forts?

- (A) Pratapgarh Fort
- (B) Sindhudurg Fort
- (C) Rajgarh Fort
- (D) Barabati Fort

Answer: (B)

Explanation: The Indian Navy is arranging a huge 'Operational Demonstration' on Navy Day at Sindhudurg Fort in Maharashtra to demonstrate its operational capabilities. It is a medieval fort located on the Arabian Sea off the coast of

Maharashtra in western India. The stronghold is located on Kurte Island, along the shore of Malvan town in Sindhudurg District in Maharashtra's Konkan area, 450 miles south of Mumbai. The Maratha Empire's Chhatrapati Shivaji Maharaj built the fort. The construction of the fort began in 1664 and took three years to complete. It is spread over 48 acres with fortified walls that are 29 feet high and 12 feet thick and stretch for two miles. One can enter the fort through the Dilli Darwaja, the main gate. Because of its architectural design, the gate is visible only from close quarters and seems to be part of the walls. It is surrounded by several smaller forts, such as Padmagad, Rajkot, and Sarjekot Forts. A handprint and footprint of the Maratha King are embedded on a slab within the fort. A small temple dedicated to the Chhatrapati also finds a place within the bounds of the fort. Hence, option (b) is correct.

5. Consider the following statements regarding 'Gajraj Suraksha' technology:

1. It is introduced by the Ministry of Environment, Forest and Climate Change of India with the support of the Wildlife Trust of India.
2. It uses an AI-based algorithm and a network of sensitive optical fiber cables to detect elephants getting close to railway tracks.
3. It aims to address the issue of elephant fatalities resulting from train accidents.

How many of the above statements is/are correct?

- (A) Only one
- (B) Only two
- (C) All three
- (D) None

Answer: (B)

Explanation: Indian Railways has introduced a cutting-edge technology named 'Gajraj' to prevent elephant accidents on railway tracks. Hence, statement 1 is not correct.

It uses an AI-based algorithm and a network of sensitive optical fibre cables to detect elephants getting close to railway tracks. Hence, statement 2 is correct.

It aims to address the issue of elephant fatalities resulting from train accidents. Hence, statement 3 is correct.

Gajraj Suraksha senses pressure waves generated by the movement of elephants



along the tracks. As elephants move, the optical fibres detect vibrations caused by their footsteps. These vibrations trigger signals within the optical fibre network, enabling the system to identify the presence of elephants up to 200 metres ahead of their arrival on the track. The OFC-based Intrusion Detection System works by sending alarms to station masters whenever movement is detected along the tracks. The network is designed in such a way that it can track the movement of the elephant with great accuracy and report it to nearby station masters. This allows them to promptly inform locomotive drivers in the affected areas. This quick communication ensures that trains can be slowed down or stopped, preventing potential collisions with elephants. Indian Railway is planning to introduce this system in West Bengal, Odisha, Jharkhand, Assam, Kerala, certain parts of Chhattisgarh, and Tamil Nadu.