

Q: Consider the following statement regarding OSIRIS-APEX mission:

1. It is a mission to study the physical changes to asteroid Apophis.
2. The mission aims to observe the physical changes induced by Earth's gravitational pull during Apophis' flyby.
3. Apophis originated in the main asteroid belt between Earth and Moon.

Choose the correct option from the codes given below:

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

Ans: a

Explanation:

- OSIRIS-APEX is a mission to study the physical changes to asteroid Apophis that will result from its rare close encounter with Earth in April 2029.
- That year, Apophis' orbit will bring it within 20,000 miles (32,000 kilometers) of Earth's surface — closer to Earth than our highest-altitude satellites.
- The mission aims to observe the physical changes induced by Earth's gravitational pull during Apophis' flyby.
- Apophis is a stony "S-type" asteroid made of silicate (or rocky) material and a mixture of metallic nickel and iron -
- Apophis is a remnant from the early formation of our solar system about 4.6 billion years ago.
- Apophis originated in the main asteroid belt between Mars and Jupiter.

Q: Consider the following statement regarding X-ray bursts:

1. It occurs in high-mass infrared binary systems.
2. The hydrogen converted into helium due to the extreme temperatures and pressures.
3. Once the outburst is over, the binary system temporarily returns to its quiescent state.

Choose the correct option from the codes given below:

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

Ans: b

Explanation:

- X-ray bursts occurs in low-mass X-ray binary systems where a neutron star and low-mass main sequence star are in orbit around one another.
- Due to their close proximity and the extreme gravity of the neutron star, the companion star overflows its roche-lobe and hydrogen is drawn into an accretion disk around the neutron star.
- This hydrogen is eventually deposited on the surface of the neutron star and immediately is converted into helium due to the extreme temperatures and pressures that exist there.
- A thin surface layer of helium is built up, and once a critical mass of helium is reached, it ignites explosively, heating the entire surface of the neutron star to several tens of millions of degrees releasing a sudden burst of X-rays.
- Once the outburst is over, the binary system temporarily returns to its quiescent state while the neutron star begins to re-accumulate the helium surface layer.
- The process repeats resulting in recurrent X-ray bursts.
- It generally occurs at regular intervals separated by several hours or days.

Q: Consider the following regarding the International Monetary Fund

1. It was established in 1944 in the aftermath of the Great Depression of the 1930s.
2. The Global Financial Stability Report is published by the IMF.

Which of the following statements is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Ans: c

Explanation:

- The formation of the IMF was initiated in 1944 at the Bretton Woods Conference. IMF came into operation on 27th December 1945 and is today an international organization that consists of 189 member countries.
- Its prominent publications include the Global Financial Stability Report, the World Economic Outlook etc.

Q: Consider the following regarding the suspension of MPs

1. Article 100 empowers the Chairman of the Rajya Sabha to name and suspend members for disorderly conduct or disobeying the Chair's rulings.
2. Article 121 grants similar powers to the Speaker of Lok Sabha.

Which of the following statements is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Ans: d

Explanation:

- Article 100 empowers the Speaker of Lok Sabha to name and suspend members for disorderly conduct or disobeying the Chair's rulings.
- Article 121 grants similar powers to the Chairman of the Rajya Sabha.

Q: Consider the following statements

1. As per the Minimum Wages Act, 1948 vide its amendment in 1986, a 'Child' is defined as a person who has not completed eighteen years of age.
2. At the same time, the Juvenile Justice (Care and Protection of Children) Act, 2015 defines 'Child' as a person who has not completed his fourteenth year of age.
3. Under the Right of Children to Free and Compulsory Education Act, 2009, 'Child' means a male or female aged six to fourteen years.

How many of the above are correct?

- a) Only one
- b) Only two
- c) All three
- d) None

Ans: a

Explanation:

- As per the Minimum Wages Act, 1948 vide its amendment in 1986, a 'Child' is defined as a person who has not completed his fourteenth year of age.
- At the same time, the Juvenile Justice (Care and Protection of Children) Act, 2015 defines 'Child' as a person who has not completed eighteen years of age.
- Under the Right of Children to Free and Compulsory Education Act, 2009, 'Child' means a male or female aged six to fourteen years.