

# OFFICERS IAS ACADEMY

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Daily MCQs: 17/09/2022

**1. The Hayabusa-2 mission aims to study**

- A. Asteroid Ryugu
- B. Asteroid Bennu
- C. Asteroid Itokawa
- D. Lagrange points

**2. The Kigali agreement to the Montreal Protocol aims at phasing out the production and consumption of**

- A. Hydrofluorocarbons
- B. Hydrochlorofluorocarbons
- C. Chlorofluorocarbons
- D. Halons

**3. Consider the following statements about the Indian Space Association (ISpA).**

- A. It is an industry body of government and private companies which aims to supplement the Centre's efforts in commercial space exploration and space-based communication.
- B. It will act as an independent and single-window agency for enabling the opening up of the space sector to start-ups and the private sector.

**Which of the statements given above is/are correct?**

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

**4. Consider the following statements about the Indo-Pacific Regional Dialogue (IPRD).**

- 1. It is the apex international annual conference of the Indian Navy and is the principal manifestation of the Navy's engagement at the strategic-level.
- 2. The Observer Research Foundation is the chief organiser of each edition of this event.

**Which of the statements given above is/are correct?**

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

5. The Thenneri inscriptions, which bear testimony to the qualifications required for members of the village administrative council, belongs to

- A. Cholas
- B. Eastern Chalukyas
- C. Hoysalas
- D. Satavahanas

**Solutions:**

1. Answer: A

**Sol:**

- The Hayabusa-2 mission was launched in 2014 when the spacecraft was sent on a six-year voyage to study the **asteroid Ryugu**. It was launched by the **Japan Aerospace Exploration Agency's (JAXA)**.
- The spacecraft arrived at the asteroid in mid-2018 after which it deployed two rovers and a small lander onto the surface. In 2019, the spacecraft fired an impactor into the asteroid's surface to create an artificial crater with a diameter of a little more than 10 metres, which allowed it to collect the samples.
- In December 2020, Hayabusa-2 delivered a small capsule that contained the rock and dust samples when it was 220,000 km from the Earth's atmosphere, which safely landed in the South Australian outback.
- Hayabusa-2's predecessor, the **Hayabusa mission**, brought back samples from the **asteroid Itokawa** in 2010.

**Why in News?**

- Since the capsule landed on Earth, scientists have been studying the material — weighing merely a few grams, but approximately 4.6 billion years old — in order to explore the foundations of the solar system. Their analyses of the samples have helped us **explore the origins of life on our planet**.
- Recent findings suggest that **water and organic materials might have been brought to our planet from the outer edges of the solar system**. The scientists made the hypothesis after analysing samples from the asteroid Ryugu.
- While the composition of particles collected from Ryugu closely matches water on Earth, the study notes there were slight differences, leading scientists to hypothesise that **our planet's water might have also originated from places other than asteroids**.

**What is an asteroid?**

- Asteroids are rocky objects that orbit the Sun, much smaller than planets. They are also called **minor planets**. According to NASA, there are 994,383 known asteroids, the remnants from the formation of the solar system over 4.6 billion years ago.
- Asteroids are divided into **three classes**. First are those found in the **main asteroid belt between Mars and Jupiter**, which is estimated to contain somewhere between 1.1-1.9 million asteroids.

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- The second group is that of **trojans**, which are asteroids that **share an orbit with a larger planet**. NASA reports the **presence of Jupiter, Neptune and Mars trojans**. In 2011, they reported an Earth trojan as well.
- The third classification is **Near-Earth Asteroids (NEA)**, which have orbits that pass close to the Earth. Those that cross the Earth's orbit are called **Earth-crossers**. More than 10,000 such asteroids are known, out of which over 1,400 are classified as **potentially hazardous asteroids (PHAs)**.
- **Ryugu is also classified as a PHA** and was discovered in 1999 and was given the name by the Minor Planet Center in 2015. It is 300 million kilometres from Earth and it took Hayabusa-2 over 42 months to reach it.

### Why do scientists study asteroids?

- Since asteroids are one of the oldest celestial bodies in the Solar System, scientists study them to look for **information about the formation and history of planets and the sun**.
- Another reason for tracking them is to **look for asteroids that could possibly crash into Earth**, leading to potentially hazardous consequences.
- **NASA's OSIRIS-REX mission** had collected samples from the **asteroid Bennu** in 2020, which will be brought to Earth in 2023. Scientists are interested in studying asteroids such as Bennu, because it hasn't undergone drastic changes since its formation over billions of years ago and therefore it contains chemicals and rocks dating back to the birth of the solar system. It is also relatively close to the Earth.

2. Answer: A

### Sol:

- The **Montreal Protocol on Substances that Deplete the Ozone Layer** is an international environmental treaty that **regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone depleting substances (ODS)** including chlorofluorocarbons (CFCs), halons and hydrochlorofluorocarbons (HCFCs).
- The stratospheric ozone layer **protects humans and the environment** from harmful levels of ultraviolet radiation from the sun. The widespread use of ODS had caused a hole in the Ozone layer of the atmosphere, which allowed some harmful radiation to reach the earth. These radiations were considered potential health hazards.
- Adopted in **1987**, the Montreal Protocol is the **only UN treaty that has been ratified by every country**.
- Under this treaty, all parties have specific responsibilities related to the phase out of the different groups of ODS, control of ODS trade, annual reporting of data, national licensing systems to control ODS imports and exports, and other matters.
- Developing and developed countries have **equal but differentiated responsibilities** along with **binding, time-targeted and measurable commitments**.
- The Montreal Protocol has been a **far more effective and successful agreement** than the climate change instruments. It has already **resulted in the phase-out of 98.6% of ozone-depleting substances**. The remaining 1.4% are the HCFCs that are in the process of being transitioned.

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**Kigali Agreement**

- The Parties to the Montreal Protocol reached agreement at their 28th Meeting of the Parties on 15 October 2016 in Kigali, Rwanda. The Agreement particularly aims at **phasing out the production and consumption of Hydrofluorocarbons** which were first introduced as a substitute to ODSs namely CFCs and Hydrochlorofluorocarbons HCFCs.
- Before the middle of this century, **current HFC use has to be curtailed by at least 85 per cent**. Countries have **different timelines** to do this. **India** has to achieve this target by **2047** while the developed countries have to do it by 2036. China and some other countries have a target of 2045.
- While the reductions for the rich countries have to begin immediately, India, and some other countries, have to begin cutting their HFC use only from 2031.
- The agreement came into force on **1st January 2019** and has been ratified by **119 countries** so far.
- The phasing down of HFCs is expected to prevent the **emission to the tune of 105 million tonnes of greenhouse gases**, which would potentially help avoid a rise in global temperature up to **0.5 degrees Celsius** by the year 2100.
- Kigali Agreement **legally binds the signatory countries** with non-compliance measures.

**Cabinet's approval**

- Last year, the Union Cabinet gave its approval for ratification of the Kigali Amendment for phasing down ozone layer-depleting hydrofluorocarbons by India under the Montreal Protocol.
- Phasing down HFCs will provide a scope for domestic manufacturing of equipment as well as alternative non-HFC and low-global warming potential chemicals to enable the industry to transition to the low global warming potential alternatives.
- In addition, there would be opportunities to **promote domestic innovation for new generation alternative refrigerants and related technologies**.

3. Answer: C

Sol:

- **Statement 1 is correct:** Government of India has launched the Indian Space Association (ISpA), an **industry body of government and private companies** which aims to **supplement the Centre's efforts in commercial space exploration and space-based communication.**

About ISpA

- ISpA is represented by leading home grown and global corporations with advanced capabilities in space and satellite technologies. Its founding members include **government bodies** such as ISRO and **private telecom companies** such as Bharti Airtel's One Web, Tata Group's Nelcom, L&T, MapMyIndia, and others.
- **Statement 2 is correct:** The industry association will act as an **independent and "single-window" agency for enabling the opening up of the space sector to start-ups and the private sector.**
- ISpA aims to contribute to the Government of India's vision of **making India Atmanirbhar (self-reliant) in the space arena**, which is fast emerging as the next growth frontier for mankind.
- ISpA will undertake **policy advocacy and engage with all stakeholders in the Indian Space domain**, including the Government and its Agencies, to make India technologically advanced and a leading player in the space arena.
- ISpA will also work towards **building global linkages for the Indian space industry** to bring in critical technology and investments into the country to create more high skill jobs.

Significance

- According to ISRO, the **current size of the global space economy stands at about USD 360 billion.** However, **India accounts for only about 2% of the space economy with a potential to capture 9% of the global market share by 2030.**
- Though India too has made significant strides in space exploration over time, **state-run ISRO has been at the centre and front of this progress.** Several private sector companies, however, have shown an interest in India's space domain, with space-based communication networks coming to the fore.
- One of the main goals of the organisation is to **supplement the government's efforts towards making India a global leader in commercial space-based excursions.** Of late, ISRO's rockets have been carrying the payload and communication satellites of various countries; now, private players will also look to broach this space with the new organisation.

4. Answer: A

Sol:

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- **Statement 1 is correct:** The Indo-Pacific Regional Dialogue (IPRD) is the **apex international annual conference of the Indian Navy** and is the principal manifestation of the Navy's engagement at the strategic-level.
- The dialogue has been **held every year since 2018**.
- **Statement 2 is incorrect:** The **National Maritime Foundation (NMF)** is the Navy's knowledge partner and chief organiser of each edition of this annual event.
  - *NMF was established in 2005 in New Delhi as the nation's first maritime think-tank for conducting independent and policy-relevant research on India's maritime interests.*
- The IPRD aims to review the prevailing geopolitics within the Indo-Pacific region and identify both opportunities and challenges arising from these geopolitical moves and countermoves of regional and extra-regional powers.
  
- **Observer Research Foundation** organises the **Raisina Dialogue**. It is a multilateral conference committed to addressing the most challenging issues facing the global community.
- Every year, global leaders in policy, business, media and civil society are hosted in New Delhi to discuss cooperation on a wide range of pertinent international policy matters.
- The Dialogue is structured as a multi-stakeholder, cross-sectoral discussion, involving heads of state, cabinet ministers and local government officials, as well as major private sector executives, members of the media and academics.
- The conference is jointly organised by the **Ministry of External Affairs and the Observer Research Foundation**.
- Observer Research Foundation is an independent think tank based in India. ORF seeks to lead and aid policy thinking towards building a strong and prosperous India in a fair and equitable world.

5. Answer: A

**Sol:**

- A study has found that the Chola-era inscriptions of Uthiramerur in Kancheepuram (TamilNadu) bear testimony to the **qualifications required for members of the village administrative council**.
- The inscriptions of Uthiramerur in Kancheepuram district dwells upon '**Kudavolai**' — a system to elect members to annual committee ('variyaṁ'), garden committee, tank committee and other committees.
- Known as "**Thenneri inscriptions**", they lay down qualifications for candidates to village administrative committees ('perumkuri sabai').
- According to the inscriptions, candidates should own land and should not have any case pending against them. He should be highly educated and should have maintained his accounts in a transparent manner.
- The inscriptions are on the walls of the **Kanthaleeswarar temple**, constructed by Sembian Mahadevi (10th century CE), the grandmother of Chola King Rajaraja, in memory of her son Uthama Chola.

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#### Tax system based on the inscriptions

- The study also revealed that the **rulers were considerate while taxing agricultural produce.**
- For areca nuts, only 50% tax would be collected for the first 10 years after cultivation. Farmers would pay full tax only after the trees started yielding fruits. Similarly, 50% tax was imposed on banana crops until the yield.

