Pre-Mix – 5 MCQs for Prelims

Subject – Science & Tech

Date – 18th March 2023

1.Consider the following statements regarding deepfakes:

1. The deep fakes are a compilation of artificial images and audio put together with machine-learning algorithms.

2. It use deep learning technology to generate text, images, audio and video scenes.

3. It can create people who do not exist and it can fake real people saying and doing things they did not say or do.

Which of the statements given above is /are correct?

A. 1 only

B. 1 and 2 only

C. 2 and 3 only

D. 1, 2 and 3

2. How do astronomers detect exoplanets?

A. By observing the visible light they reflect

B. By detecting the gravitational pull they exert on their parent star

C. By analyzing the sound waves they emit

D. By measuring the temperature of their atmosphere

3. With reference to the Mars Orbiter Mission sometimes mentioned in the news, consider the following statements:

1. Mars Orbiter Mission was India's first interplanetary mission to study the Martian atmosphere.

2. The mission made India the second Asian country and the Six in the world to get to the planet

3. MOM was launched aboard a Geosynchronous Satellite Launch Vehicle

Which of the statements given above is /are correct?

A. 1 and 3 only

B. 1 only

C. 1 and 2 only

D. 1, 2 and 3

4. With reference to the Lumpy skin disease (LSD) sometimes mentioned in the news, consider the following statements

1. Lumpy skin disease is a fungal disease of cattle and water buffalo caused by the Mucormycosis fungus.

2. It is spreads by blood-sucking insects like mosquitoes, flies and ticks

3. There is no vaccine available to cure to an LSD epidemic

Which of the statements given above is /are correct?

A. 1 and 3 only

B. 2 only

C. 2 and 3 only

D. 1, 2 and 3

5. Consider the following statements with reference to Tiangong Space Station:

1. The Tiangong space station is a Chinese space station being built in low Earth orbit

2. China is the second country in history to have put both astronauts into space and to build a space station

3. Tiangong is smaller than the International Space Station

Which of the statements given above is/are correct?

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Answers with Explanations

Click here to watch the following topics on YouTube.

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Answer : D

Explanation

Deepfake technology

The **Cyberspace Administration of China**, the country's cyberspace watchdog, is rolling out new regulations, to be effective from January 10, to **restrict the use of deep synthesis technology** and curb disinformation.

Deep synthesis

- **It** is defined as the use of technologies, including **deep learning and augmented reality**, to generate text, images, audio and video to create virtual scenes.

- One of the most notorious applications of the technology is **deepfakes**, where synthetic media is used to **swap the face or voice** of one person for another.

- Deepfakes are getting **harder to detect** with the advancement of technology. It is used to generate **celebrity porn videos, produce**

fake news, and commit financial fraud among other wrongdoings.

- Under the guidelines of **China's new rules**, companies and platforms using the technology **must first receive consent from individuals before they edit their voice or image**.

What is a deepfake?

- Deepfakes are a **compilation of artificial images and audio** put together with machine-learning algorithms to **spread misinformation** and replace a real person's appearance, voice, or both with similar artificial likenesses or voices.

- It can **create people who do not exist** and it can fake real people saying and doing things they did not say or do.

- The **term deepfake originated in 2017**, when an anonymous Reddit user called himself "Deepfakes." This user manipulated Google's open-source, deep-learning technology to create and post pornographic videos. The videos were doctored with a technique known as **face-swapping**. The user "Deepfakes" replaced real faces with celebrity faces.

What are other countries doing to combat deepfakes?

- The **European Union** has an updated **Code of Practice** to stop the spread of disinformation through deepfakes.

- In July, last year, the **U.S**. introduced the **bipartisan Deepfake Task Force Act** to assist the Department of Homeland Security (DHS) to counter deepfake technology. The measure directs the DHS to conduct an annual study of deepfakes — assess the technology used, track its uses by foreign and domestic entities, and come up with available countermeasures to tackle the same.

- In **India,** however, there are **no legal rules against using deepfake technology.** However, specific laws can be addressed for

misusing the tech, which **include Copyright Violation, Defamation and cyber felonies**
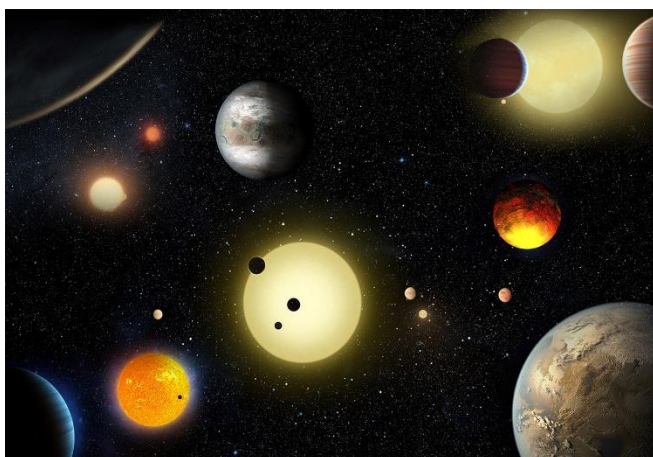
2. How do astronomers detect exoplanets?

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Answer : B

Explanation

- Astronomers primarily use the radial velocity method to detect exoplanets, which involves measuring the small wobbles in a star's motion caused by the gravitational pull of an orbiting planet. This method can also be used to determine an exoplanet's mass and distance from its parent star.

- Other methods, such as the transit method (detecting the small dip in a star's brightness as an exoplanet passes in front of it) and direct imaging (taking a picture of the exoplanet), can also be used to detect exoplanets, but they are generally less common and can be more challenging to perform.

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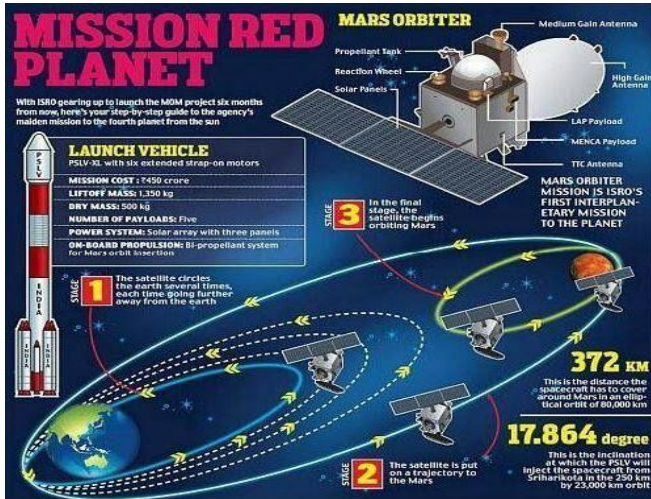**Which of the statements given above is /are correct?**

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B. 1 only

C. 1 and 2 only

D. 1, 2 and 3

Answer : B

Explanation

The Mars Orbiter Mission (MOM) or Mangalyaan is a space probe launched by the Indian Space Research Organization in 2013.

- **Statement 1 is correct**: Mangalyaan was India's first interplanetary mission. India's Mangalyaan mission is aimed at studying the Martian atmosphere. The indigenously-built space probe has been in Martian orbit since 2014.

- **Statement 2 is not correct**: The mission made India the **first Asian country and the fourth in the world after Roscosmos, NASA, and the European Space Agency**, to get to the planet. • Its objective is to explore Martian surface features, mineralogy, morphology and atmosphere using indigenous scientific instruments. A crucial objective of MOM was to develop technologies required for planning, designing, management and operations of an interplanetary mission.

- **Statement 3 is not correct**: MOM was launched aboard PSLV C-25 (an XL version of the PSLV). ISRO spent $75 million to launch the mission, making it the least-expensive Mars mission to date.

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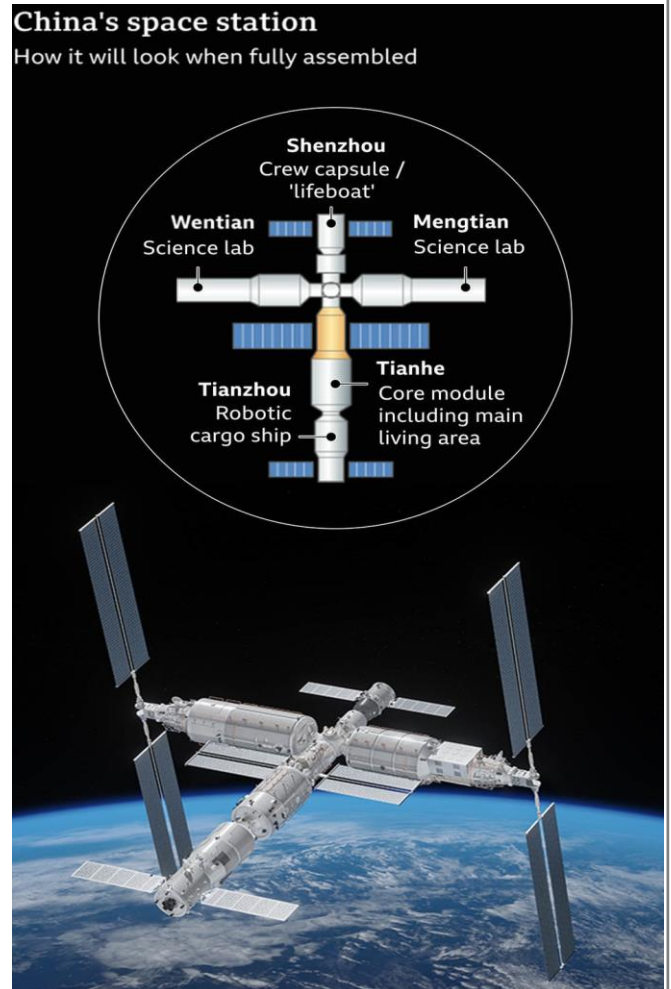C. 2 and 3 only

D. 1, 2 and 3

Answer : B

Explanation
Lumpy skin disease

- Some 1,229 cattle across five districts of **Gujarat** have been infected with Lumpy Skin Disease (LSD), an infectious viral disease, in the past one month

Lumpy skin disease

- It is caused by infection of **cattle** or **buffalo** with the **poxvirus Lumpy skin disease virus (LSDV).**

- Historically, LSD has remained confined to **Africa**, where it was first **discovered in 1929**, and parts of West Asia.

- LSD was **first reported in Asia and the Pacific region** in 2019 in north west China, Bangladesh and India.

Symptoms:

- It appears as **nodules of two to five-centimetre diameter all over the body**, particularly around the head, neck, limbs, udder and genitals.

- The lumps gradually open up like large and deep wounds.

Transmission:

- The LSD virus easily spreads by **blood-sucking insects like mosquitoes, flies and ticks** and through saliva and contaminated water and food.

Treatment:

- There are **no specific antiviral drugs** available for the treatment of lumpy skin disease.

- Vaccines are the only cure to an LSD epidemic.

5. Consider the following statements with reference to Tiangong Space Station:

1. The Tiangong space station is a Chinese space station being built in low Earth orbit

2. China is the second country in history to have put both astronauts into space and to build a space station

3. Tiangong is smaller than the International Space Station

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B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Answer : C

Explanation

Tiangong space station

China selects mystery astronauts for 2023 missions to Tiangong space station

About

- China will later this year send two crews to the now fully operational Tiangong to spend six months in orbit conducting science experiments and keeping the space station maintained.

- Two three-person crews have been selected for the **Shenzhou 16 mission, due to launch in May, and the following Shenzhou 17 mission**, launching six months later. The missions will lift off atop Long March 2F rockets from Jiuquan in the Gobi Desert

- Tiangong, which means **"Heavenly Palace**," will consist of **Tianhe** the main habitat for astronauts, and two modules dedicated to hosting experiments, **Mengtian and Wentian**

- Tiangong will be much smaller than the International Space Station (ISS)

- Tiangong will also be **lighter than the ISS,** which weighs about 400 tons (450 metric tons)

- China is **only the third country** in history to have put both astronauts into space and to build a space station, after the Russia and the US.

China's space station
How it will look when fully assembled

Comparison of Space Stations			
	International Space Station	Chinese Space Station	Mir
Maximum Length	109 m	37 m	31 m
Mass	420 metric tons	60 - 70 metric tons	130 metric tons
Lifespan	26 yrs if deorbited in 2024	>10 yrs	15 yrs
Crew Size	6, or 9 short-term	3, or 6 short-term	3, or 6 short-term
Initial Launch Date	1998	2021	1986

ChinaPower CSIS