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1. Disclosure Scheme to Tag Rogue Drones

Why in News?

The **Union Civil Aviation Ministry** has announced a scheme for voluntary disclosure of "non-compliant" unmanned aerial vehicles (UAVs), or drones, being operated inside India.

- It has been done to make up for the lack of a comprehensive database.
- This has been done in the wake of two major global attacks by UAVs over the last few months- on Saudi Arabian refineries and the killing of Iranian military commander in Baghdad.

Key Points

- The government has asked the owners of unregistered drones to submit the required information to the government by January 31.
- The Ministry's notice pointed out that upon successful submission of voluntary disclosure, a **Drone Acknowledgement Number (DAN)** and an **Ownership Acknowledgement Number (OAN)** will be issued online.
    - However, the DAN or OAN does not confer any right to operate drones in India if it does not fulfill the provisions given in the CAR (civil aviation requirement).
- Under regulations issued by the Directorate General of Civil Aviation (DGCA), penalties under the Aircraft Act and the Indian Penal Code have been prescribed for those failing to comply with norms.
- The Civil Aviation Ministry has finalised the National Counter Rogue Drone Guidelines to lay down an array of counter-rogue measures and guidelines that can be deployed for handling threats to installations from UAVs.

Present Status in India

- India has a **'No Permission-No Takeoff' (NPNT) policy for UAVs.**
    - It mandates the drone to be operated only with a regulatory permission received through the Digital Sky Platform.
- Further, a pilot also needs certification, requiring a remote pilot licence or an unmanned aerial operator permit before operating a drone.

2. NEONs - Virtual human

Why in News?

NEON was one of the most-discussed new concepts at the annual Consumer Electronics Show (CES) held in Las Vegas in 2020.

- NEONs, being called the **world's first artificial humans,** have been **created by Samsung's Star Labs.**

NEON:

- NEONs are computationally created virtual humans — the word derives from **NEO (new) + humaN.**
- NEONs look and behave like real humans, and could one day develop memories and emotions.
- For now, the virtual humans can show emotions when manually controlled by their creators.
    - But the idea is for NEONs to become intelligent enough to be fully autonomous, showing emotions, learning skills, creating memories, and being intelligent on their own.
- **A virtual human** is a Computer Generated (CG) human simulation with artificial intelligence.
    - A virtual human can have a CG human body, and CG voice and computer empowered senses. Virtual humans can be applied in various domains such as education, marketing, branding, training & sales.
- NEONs are an interface of technologies and services. They can be used to answer the queries at a bank, to welcome at a restaurant or to read out the breaking news on Television.
    - This makes them different from virtual assistance.

3. H9N2

Why in News?

Avian influenza A(H9N2) virus infection has been reported in a 17-month-old boy in Maharashtra.

- This is the country's first human case of infection with H9N2 virus.
- H9N2 viruses have been observed in poultry in India several times.

About H9N2 Virus

- H9N2 is a **subtype of influenza A virus,** which causes **human influenza as well as bird flu.**
- The H9N2 subtype was isolated for the first time in Wisconsin, US in 1966 from Turkey flocks.
- H9N2 viruses are found worldwide in wild birds and are endemic in poultry in many areas.

- **Cases of Human Infection**
    - H9N2 virus infections in humans are rare, but likely under-reported due to typically mild symptoms of the infections.
    - Cases of human infection have been observed in Hong Kong, China, Bangladesh, Pakistan, and Egypt. The first case globally was reported from Hong Kong in 1998.

- **Emerging Threat**
    - H9N2 viruses could potentially play a major role in the emergence of the next influenza pandemic.
    - According to the **World Health Organization (WHO)**, with avian influenza viruses circulating in poultry, there is a risk for sporadic infection and small clusters of human cases due to exposure to infected poultry or contaminated environments.

Bird Flu

- **Bird flu**, also called **avian influenza**, is a viral infection that can infect not only **birds**, but also humans and other animals.
- Most forms of the virus are restricted to **birds**. H5N1 is the most common form of **bird flu**. Others are H7N9, H9N2.
- According to the World Health Organization, H5N1 was first discovered in humans in 1997 and has killed nearly 60 percent of those infected.

4. Yada Yada Virus

Why in News?

A virus has been detected in Australian mosquitoes; it has been provisionally named the Yada Yada virus (YYV).

Yada Yada

- It is an alphavirus, a group of viruses to which chikungunya virus and the astern equine encephalitis belongs.
- It does not pose a threat to human beings.

5. GSAT -30

Why in News?

The telecommunication satellite- GSAT-30 has been launched by Indian Space Research Organisation (ISRO) from the Spaceport in French Guiana.

- It was launched from the foreign launcher because it is much heavier than the lifting capacity of its geostationary launch vehicle GSLV-MkII (It has the capacity to lift 2000kg), as GSAT-30 weighs 3,357-kg.

GSAT -30

- It is a telecommunication satellite-placed at 36,000 km height.
- It will replace INSAT-4A in orbit.
- The launch vehicle is named Ariane 5 VA-251.
- It is equipped with 12 normal C band and 12 Ku band transponders.
    - The Ku and C bands are part of a spectrum of frequencies, ranging from 1 to 40 gigahertz, that are used in satellite communications.
- It's coverage ranges from the Indian mainland to the areas stretching from Australia to Europe.

Applications

- It will provide:
    - DTH (Direct to Home) television services
    - Connectivity to VSATs (that support working of banks) ATMs,
    - Television uplinking and teleport services
    - Digital Satellite news gathering
    - E-governance

6. Oldest Material on Earth

Why in News?

Scientists have found 4.6 to 7-billion-year-old presolar grains of Silicon Carbide (SiC) in the **Murchison meteorite** which fell in **Australia in 1969**.

- Meteorites are meteoroids (objects in space that range in size from dust grains to small asteroids) that survive a trip through the atmosphere and hits the ground.

Key Points

- The presolar grains of SiC are the oldest solid materials ever found.
- These grains were formed before the solar system's formation and thus are termed “presolar grains”.
- The presolar grains are very rare, found only in about 5% of meteorites that have fallen to Earth.
- It may reveal the phenomenon of formation of stars in the Milky Way Galaxy.
    - As the presence of Silicon Carbide in the meteorite are samples of stardust.
- It also provides clues about the rate of star formation in the Milky Way galaxy.

Silicon Carbide (SiC)

- It is also known as Carborundum.
- A compound of silicon and carbon.
- Silicon carbide is a semiconductor material and is an emerging material for applications in semiconductor devices.
- It is one of the most important industrial ceramic materials.
- It is widely used as an abrasive (capable of polishing or cleaning a hard surface) and steel additive and structural ceramic.

Stardust

- Stardust is formed by the material ejected from stars and carried by stellar winds, getting blown into interstellar space.
    - Interstellar space is defined as that which lies beyond a magnetic

region that extends about 122 Astronomical Unit (AU) from the sun.

- During the solar system's birth, this dust was incorporated into everything that formed including the planets and the sun but survived intact until now only in asteroids and comets.

7. Taal Volcano

Taal volcano on the island of Luzon, near Manila, Philippines erupted on 12th January, 2020.

- Taal is classified as a **complex volcano** by the Philippine Institute of Volcanology and Seismology (PHIVOLCS).
- A complex volcano, also called a compound volcano, is defined as one that doesn't have just one main vent or cone but several eruption points.
    - Another such example is Mount Vesuvius on the west coast of Italy.
- Taal has erupted more than 30 times in the last few centuries, the most recent was in 1977.

Volcano

- A volcano is an opening on the surface that allows material warmer than its surroundings to escape from its interior.
- When this material escapes, it causes an eruption.
- There are three reasons why magma might rise and cause eruptions onto Earth's surface:
    i. Magma can rise when pieces of Earth's crust called tectonic plates slowly move away from each other.
        - The magma rises up to fill in the space.
        - When this happens underwater volcanoes can form.
    ii. Magma also rises when these tectonic plates move toward each other.
        - When this happens, part of Earth's crust can be forced deep into its interior.
        - The high heat and pressure cause the crust to melt and rise as magma.
    iii. A final way that magma rises is over hot spots.
        - Hot spots are the hot areas inside of Earth.
        - These areas heat up magma, which becomes less dense.
        - Eventually it rises and may erupt.