1. IHU (Instituts Hospitalo-Universitaires)

Why in News?

- Amid the spread of the Omicron Variant of coronavirus, the discovery of a new strain named 'IHU (Instituts Hospitalo-Universitaires)' that emerged in France raises fears across the world.

Highlights:

- The variant Is a sub-lineage of the B.1.640. It has been classified as B.1.640.2.
- The variant has 46 mutations and 37 deletions in its genetic code, more than Omicron. Many of these affect the Spike Protein.
- Till now, only a dozen cases have been reported in France. No other country has detected any new cases of the new variant. It is certainly not as alarming as the spread of Omicron.
- While the large number of significant mutations in this variant has attracted the interest of researchers, and raised concerns among the public, the B.1.640 is not spreading at a rate that is Unnerving.
- The World Health Organization (WHO) has not yet deemed this IHU variant a variant of interest, a variant of concern, or even a variant under investigation.

2. Bioenergy Crop

Why in News?

- A New Study has recently found that converting annual crops to perennial bioenergy crops can induce a cooling effect on the areas where they are cultivated.

Highlights:

- The researchers simulated the biophysical climate impact of a range of future bioenergy crop cultivation scenarios. Eucalyptus, poplar, willow, miscanthus and switchgrass were the bioenergy crops used in the study.
- The study also demonstrated the importance of the crop type choice, the original land use type upon which bioenergy crops are expanded, the total cultivation area and its spatial distribution patterns.
- Crops from which Biofuels are produced or manufactured are called Biofuel crops or Bioenergy Crops. "Energy crops" is a term used to describe biofuel crops.
- Wheat, corn, main edible oilseeds/edible oils, sugarcane, and other crops are among them.

- Biofuels have a number of advantages over fossil fuels, including the ability to burn cleaner and emit fewer pollutants and greenhouse gases, such as carbon dioxide, into the sky. They're also environmentally friendly, and energy corporations frequently mix Biofuels with gasoline
- Cultivating eucalypt shows generally cooling effects that are more robust than if switchgrass is used as the main bioenergy crop, implying that eucalypt is superior to switchgrass in cooling the lands biophysically.
- Cooling effects are more for eucalypt and the greatest warming effects are seen for switchgrass.
- Replacing forests with switchgrass not only results in biophysical warming effects but could also release more carbon through deforestation than converting other short vegetation to bioenergy crops.

3. Aquamation

Why in News?

- The Nobel Peace Prize winner Anglican archbishop and anti-apartheid campaigner Desmond Tutu died. He was very passionate about protecting the environment and taking necessary actions.

Highlights:

- In concurrence of his passion to save the environment, his body underwent aquamation, a green alternative to traditional cremation methods.
- The process of aquamation uses energy which is five times less than fire. It also reduces by about 35% the amount of greenhouse gases that are emitted during cremation
- It is a process in which the body of the deceased is immersed for a few hours in a mixture of water and a strong alkali in a pressurized metal cylinder and heated to around 150 degree centigrade.
- The combination of gentle water flow, temperature and alkalinity accentuate the breakdown of the organic materials.
- The process leaves behind bone fragments and a neutral liquid called effluent.
- The effluent is sterile, and contains salts, sugars, amino acids and peptides.
- There is no tissue and no DNA left after the Process Completes.

- **Background:** The process was developed and patented in 1888 by Amos Herbert Hanson, a farmer who was trying to develop an ingenious way to make fertilizer from animal Carcasses.
- The First Commercial System was installed at Albany Medical College in 1993.
- Thereafter, the process continued to be in use by hospitals and universities with donated body programmes.
- This process is referred to as alkaline hydrolysis or as Cremation Association of North America (CANA) (an international non-profit organisation) calls it flameless cremation.
- The process Is also known as water cremation, green cremation or chemical cremation.

4. China's bridge over Pangong Tso

Why in News?

- China is building a bridge across the Pangong Tso area connecting the North and South Banks which will significantly reduce the time for moving troops and equipment between the two sides.

Pangong Tso:

- Pangong Tso or Pangong Lake is an endorheic lake in the Himalayas situated at a Height of about 4,350 m.
- It is 134 km long and extends from India to the Tibetan Autonomous Region, China.
- Approximately 60% of the length of the lake lies within the Tibetan Autonomous Region.

- The lake is 5 km wide at its broadest point. All together it covers 604 sq.km.
- During winter the lake freezes completely, despite being saline water.
- It is not a part of the Indus river basin area and is geographically a separate landlocked river basin. Earlier, Pangong Tso had an outlet to Shyok River, a tributary of Indus River, but it was closed off due to natural damming.

Tactical Significance of the Lake:

- It lies in the path of the Chushul approach, one of the main approaches that China can use for an offensive into Indian Territory.
- During the 1962 war, this was where China launched its main offensive — the Indian Army fought heroically at Rezang La under Maj. Shaitan Singh.
- Not far away, to the north of the lake, is the Army's Dhan Singh Thapa post, named after Major Dhan Singh Thapa who was awarded the country's highest gallantry award, the Param Vir Chakra.
- Major Thapa and his platoon were manning the Sirijap-1 outpost which was essential for the defense of the Chushul airfield.

Connectivity in the Region:

- Over the years, the Chinese have built motorable roads along their banks of the Pangong Tso. This points to the importance accorded by the Chinese to the area.
- Even during peacetime, the difference in perception over where the LAC lies on the northern bank of the lake makes this contested terrain.
- In 1999, when the Army unit from the area was moved to Kargil for Operation Vijay, China took the opportunity to build 5 km of a road inside the Indian Territory along the lake's bank.
- From one of these roads, Chinese positions physically overlook Indian positions on the Northern Tip of the Pangong Tso Lake.

What is the Importance of the Bridge over Pangong Tso?

- The bridge over Pangong Tso is located around 25 kms ahead of the LAC in Chinese territory and will significantly reduce the time for movement of Chinese army.
- The Indian Army gained tactical advantage over the PLA on the south bank in end August 2020 by occupying several peaks lying vacant since 1962 gaining a dominating view.
- This has prompted China to build deep alternate roads behind the friction points away from the line of sight.

How is India Responding to developments on the ground?

- The bridge is well within Chinese territory.
- The implications of this new bridge will have to be factored in the Indian Army's Operational Planning for the future.
- On its part, over the last few years India has been focusing on infrastructure development in forward areas and improving connectivity to the forward areas.
- Large-scale construction of roads, bridges and tunnels is underway all along the LAC.

5. Traditional vaccines just as effective, say US Scientists

Why in News?

- Vaccines like Biological E's Corbevax and Bharat Biotech's Covaxin that are made by traditional methods are "just as effective" as the latest mRNA technology-based vaccines a/c to US Scientists.

What are Vaccines?

- A vaccine is a biological preparation that provides active acquired Immunity to a Particular Infectious Disease.
- It typically contains an agent that resembles a disease-causing microorganism and is often made from weakened or killed forms of the microbe, its toxins, or one of its surface proteins.

Types of Vaccines:

- There are several types of vaccines, including:
  - ✓ Inactivated vaccines
  - ✓ Live-attenuated vaccines
  - ✓ Messenger RNA (mRNA) vaccines
  - ✓ Subunit, recombinant, polysaccharide, and conjugate vaccines
  - ✓ Viral Vector Vaccines

Inactivated Vaccines:

- Inactivated vaccines use the killed version of the germ that causes a disease.
- Inactivated vaccines usually don't provide immunity (protection) that's as strong as live vaccines.

- So you may need several doses over time (booster shots) in order to get ongoing immunity against diseases.
- Inactivated vaccines are used to protect against: Hepatitis A, Flu (shot only), Polio (shot only), Rabies etc.

Live-attenuated Vaccines:

- Live vaccines use a weakened (or attenuated) form of the germ that causes a disease.
- Because these vaccines are so similar to natural infection that they help prevent, they create a strong and long-lasting immune response.
- Just 1 or 2 doses of most live vaccines can give you a lifetime of protection against a germ and the disease it causes.
- They need to be kept cool in refrigerated conditions.
- Live vaccines are used to protect against Measles, mumps, rubella (MMR), Rotavirus, Smallpox, Chickenpox, Yellow fever

Messenger RNA Vaccines:

- Researchers have been studying and working with mRNA vaccines for decades and this Technology was used to make some of the COVID-19 vaccines.
- mRNA vaccines make proteins in order to trigger an immune response.
- mRNA vaccines have several benefits compared to other types of vaccines, including shorter manufacturing times and, because they do not contain a live virus, no risk of causing disease in the person getting vaccinated.

How does mRNA Vaccine Work?

- The mRNA vaccines function differently from traditional vaccines.
- Traditional vaccines stimulate an antibody response by injecting a human with antigens.
- mRNA vaccines inject a fragment of the RNA sequence of a virus directly into the cells, which then stimulate an adaptive immune response mRNA fragment is a specific piece of the virus that carries instructions to build the antigen of the virus.
- An advantage of RNA vaccines is that they Stimulate Cellular Immunity.