Prelim Bits 27-09-2022 | UPSC Daily Current Affairs

AVGAS 100 LL

The Centre launched the indigenously-developed aviation fuel AVGAS 100 LL.

- The Aviation Gasoline, AVGAS 100 LL, is a **higher-octane Aviation fuel** that was developed by Indian Oil Corporation.
- It is a special aviation fuel designed for use in turbo charged reciprocating piston engine aircrafts and Unmanned Ariel Vehicles.
- It has been certified by the Directorate General of Civil Aviation (DGCA).
- It meets the product specifications with superior performance quality standards, as compared to imported grades.
- Currently India is importing this product from European countries.
- **Significance** - As demand for air transport in India is expected to increase manifolds in the future, there is going to be a huge demand for trained pilots also.
- For this, the number of Flying Training Organisations and trainee aircraft for pilot training is also expected to increase significantly.
- So, the launch of AVGAS 100 will serve the needs of a thriving aviation industry.

> *AV Gas market is expected to grow from the current $1.92 billion to $2.71 billion by 2029.*

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Avalanche Monitoring Radar

An avalanche monitoring radar has been installed in North Sikkim by the Army and Defence Geoinformatics and Research Establishment (DGRE), a lab under the Defence Research Development Organisation (DRDO).

> *The Defence Research Development Organisation is involved in forecasting and mitigation of avalanche hazards faced by the Army in the Himalayan region.*

- The first-of-its-kind Avalanche Monitoring Radar has been set up at an altitude of

15,000 feet in North Sikkim.
- The radar has the capability to **detect avalanches within 3 seconds** of its trigger in the super high altitude areas.
- This radar can also be employed to detect landslides.
- The radar can see through snow, fog as well as in the night, making it an all-weather solution.
- **Working** - The radar uses a series of short micro wave pulses, which are scattered at the target and can detect an avalanche.
- The radar can permanently scan the targeted slope for avalanche release and track the path of the avalanche and its size in case it is triggered.
- It covers an area of 2 sq.km, obviating the requirement to place additional instruments in dangerous avalanche-prone areas.
- The radar is also linked to an alarm system, enabling automatic control and warning measures in case an avalanche is triggered.
- Images and videos of the event are automatically recorded for future analysis by experts.

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Odisha's Encyclopedia on Tribes

Five edited volumes of 'Encyclopedia of Tribes in Odisha' was published by Scheduled Castes & Scheduled Tribes Research and Training Institute (SCSTRTI) and Odisha State Tribal Museum.

> *Established in 1955, the Scheduled Castes & Scheduled Tribes Research and Training Institute is the premier and oldest Tribal Research Institute of the country.*

- As per 2011 census, tribes account for 22.85% of the Odisha's population.
- Odisha is home to third largest tribal population of India.
- Odisha homes 62 tribes including 13 Particularly Vulnerable Tribal Groups (PVTGs).
- Majority of Scheduled Tribes live in hilly and forest regions.
- Their economy is largely subsistence oriented, non-stratified and non-specialized.

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Afghanistan - Not a Major Non-NATO Ally

The U.S. President has terminated the designation of Afghanistan as a Major Non-NATO ally (MNNA) of the United States.

- In 2012, the US designated Afghanistan a MNNA ally.
- The designation gave several facilities and concessions to Afghanistan in terms of defence and security-related assistance and equipment.
- The change in Afghanistan's status follows the withdrawal of U.S. troops from the country in 2021, ending nearly 20 years of war.
- After this, Taliban captured power in Afghanistan.

Major Non-NATO Ally

- The Major Non-NATO Ally (MNNA) status was first created in 1987.
- The United States can name a country MNNA under the Section 517 of the Foreign Assistance Act of 1961 and the Arms Export Control Act.
- With Afghanistan's status rescinded, the U.S. will have 18 major non-NATO allies.
- They are Argentina, Australia, Bahrain, Brazil, Colombia, Egypt, Israel, Japan, Jordan, Kuwait, Morocco, New Zealand, Pakistan, the Philippines, Qatar, South Korea, Thailand and Tunisia.
- Taiwan is treated as an MNNA, without formal designation as such.

Recently, a resolution has been tabled in the U.S. House of Representatives to designate India as a major non-NATO ally.

- **Benefits** - A major non-NATO ally is eligible for loans of material, supplies, or equipment from the US for cooperative research, development, testing, or evaluation purposes.
- They are eligible as a location for U.S.-owned War Reserve Stockpiles to be placed on its territory outside of U.S. military facilities.
- These countries can enter into agreements with the US for the cooperative furnishing of training (bi- or multi-lateral basis), if the financial arrangements are reciprocal and provide for reimbursement of all U.S. direct costs.
- Eligible, to the maximum extent feasible, for priority delivery of Excess Defense Articles transferred under section 516 of the Foreign Assistance Act (if located on the southern or south-eastern flank of NATO).
- Eligible for consideration to purchase depleted uranium ammunition.
- Allows funding to procure explosives detection devices and other counter-terrorism research and development projects under the auspices of the Department of State’s Technical Support Working Group.

Reference

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Coffee-ring Effect

- When a drop of spilt coffee dries up, the outermost edge of the dried drop is a little darker than the centre, forming a darker 'ring'. This is called the 'coffee ring effect'.
- This is caused by the **outward drift of suspended coffee particles** from the centre, causing a denser, darkened rim.
- Now, researchers from IIT-Madras, have shown that after reaching the rim, as the drop dries, some of the particles undergo an inward drift too.

  While the inward drift would persist for sub-micron-sized particles, it would decrease with particle size.

- **Gapped coffee ring -** The inward movement takes place because the particles are 'squished' between the solid plate and the evaporating liquid interface.
- Hence, the 'coffee' ring is not formed at the point where the liquid touches the solid, but there is a small gap between the outermost edge and the ring.
- Using the theory of evaporating drops, the researchers could calculate the rate at which the liquid interface gets flattened.
- **Benefits** - This research has applications in agriculture, forensic science and even disease diagnosis.
- Understanding the drying of biologically relevant fluids like blood can help diagnose anaemic and hyperlipidaemic conditions.
- The size-based separation of different molecules in biological fluids can provide useful information about disease conditions.
- Generally, the coffee-ring effect has implications for the manufacture of high tech materials such as fuel cells, displays, and sensors.
- That's because these devices are made by depositing a coating onto a surface. (E.g.): Drop-casting (Depositing tiny droplets onto the surface).

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