27-02-2018

Rustom-2 UAV successfully test-flown.

What in news:

- India's under-development Unmanned Aerial Vehicle Rustom-2 was successfully test-flown by the Defence Research and Development Organisation (DRDO).

About Rustom -2:

- Rustom-2 belongs to a family of UAVs under development, besides Rustom-1 and Rustom-H.
- It is a Medium Altitude Long Endurance drone (MALE).
- It can fly up to an altitude of 22,000 feet and has an endurance of over 20 hours.
- It is capable of carrying payloads for electronic and signal intelligence missions.
- Rustom-2 has been modelled on Rustom-H UCAV with light airframe.
- It is 9.5 metres long and stands 2.4 metres tall with wingspan of 20.6 metres.
- It is propelled by two 3-bladed NPO Saturn engines.
- Its tail section comes with T-type vertical stabiliser and high-mounted horizontal tail plane.
- It can fly at around 280 km/h and carry variety of payloads like Long Range Electro Optic (LREO), Medium Range Electro Optic (MREO), Electronic Intelligence (ELINT), Synthetic Aperture Radar (SAR), Communication Intelligence (COMINT) and Situational Awareness Payloads (SAP) for performing missions even during the night.
- Rustom 2 can fly missions on manual as well as autonomous modes.
- Its data link developed by Defence Electronics Application Laboratory (DEAL) transmits the ISR data to the armed forces' ground control station in realtime allowing prompt action.
- Rustom 2's on board way-point navigation system allows drone to conduct missions autonomously.
- It will be used by all three services of Indian armed forces, primarily for intelligence, surveillance and reconnaissance (ISR) operations.
- Several critical systems and components of Rustom 2, like its airframe, avionics sub-systems, flight control, landing gear etc.
- have been made indigenously and some in collaboration with private manufacturers.
- Currently, the three services employ hundreds of Israeli drones and have projected a requirement of hundreds of more UAVs, including armed variants, in the near future.
- The DRDO is also developing other drones in different categories.

Expected prelims question:

Consider the following statements about Rustom-2

1. It is a UAV
2. It is a Medium Altitude Long Endurance drone (MALE)

Which of the above statements is/are correct?

a) Only 1
b) Only 2

c) Both 1 and 2
d) None of above

Ans -c

Expected mains question

Q) Series of Rustom Drones can be used inthree services of Indian armed forces. Discuss its important features and significance in Indian armed forces.

Indian Railways Inducts Two State-of-the-Art High Horse Power Locomotives

What in news:

- Indian Railways inducted the first of the fully digitally enabled high horse power locomotive with greater reliability, maintainability and availability manufactured in collaboration with General Electric (GE).

About news:

- The digitally-enabled locomotives based on the state-of-the-art insulated-gate bipolar transistor (IGBT) technology, offers the combined advantages of high efficiency and fast switching.
- The two HHP prototype locomotives are wholly-designed in India under the 'Make in India' programme and manufactured under the PPP model through a memorandum of understanding with GE.
- The total investment amount is Rs13,000 crore and under the agreement Indian Railways has a 26-per cent stake.
- The first GE manufactured diesel locomotive No 49001 for Indian Railways, shipped from the US, landed in the country on 11 October 2017 and was put to extensive trials.

About HHP locomotives

- The GE Locomotives are equipped with four-stroke engine with 12 cylinders, 06 traction motors and AC Dual Cab locomotive.
- The engines have safety features including self load, toilet facility, upgraded computer-controlled braking (CCB system), electronic fuel injection system, fuel-efficient locomotive, IGBT-based traction technology and is compliant with India's UIC emission norm.
- The locomotive is also the first fully digitally-enabled locomotive with greater reliability and availability and is also provided with a device to manage disasters.
- The Railways has set up state-of-the-art maintenance sheds at Roza, UP and Gandhidham, Gujarat for better maintenance of its assets for better reliability and safety.

About IGBT technology

- It has a three-terminal power semiconductor device primarily used as an electronic switch, which was developed to give the combined advantages of high efficiency and fast switching.

Uses of IGBT Technology

- It offers greater power gain than the standard bipolar type transistor combined with the higher voltage operation and lower input losses.

Expected prelims question

Consider the following statements

1. The digitally-enabled locomotives based on the insulated-gate bipolar transistor (IGBT) technology
2. IGBT technology has a three-terminal power semiconductor device primarily used as an electronic switch

Which of above statements is/are incorrect?

a) Only 1
b) Only 2
c) Both 1 and 2
d) None of above

Ans –d

Expected mains question

Q) The digitally-enabled locomotives in railways based on insulated-gate bipolar transistor (IGBT) technology. Explain its significance in Indian railways.