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ANALYSIS**



LAKSHYA ACADEMY®

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1 – About India’s first 3D-printed post office:

GS III

Science and Technology

- **Context:**

- Recently, the first 3D-printed post office in India opened in Bengaluru's Cambridge Layout neighbourhood.

- **Important details:**

- With help from IIT Madras, the international company Larsen & Toubro Limited built the post office.

- **Use cases for 3D printing:**

- The 2010s saw a huge increase in the use of 3D printing, which was developed in the 1980s.
- Technology at the time was expensive, inefficient, and prone to errors.
- Some of these problems have been resolved in recent years, increasing the use of 3D printing.
- For example, it is used to make components for vehicles and rockets, respectively, in the aerospace and automotive industries.

- **About:**

- Additive manufacturing, also known as 3D printing, is a process that uses computer-generated plans to produce three-dimensional objects layer by layer.
- To build items that vary in size, shape, rigidity, and colour, layers of a material like plastic, composites, or biomaterials are built up in an additive process.

- **How exactly is 3D printing done?**

- To do 3D printing, a laptop connected to a 3D printer is needed.
- All they have to do is use CAD software to make a 3D model of the required product and select "print."
- The 3D printer takes care of the rest.
- The method that 3D printers employ to construct the desired thing is layering.
- 3D printers build up the final product layer by layer until it exactly mimics the original design.
- It essentially stacks hundreds or thousands of two-dimensional prints on top of one another to produce a three-dimensional object.

- **Some uses of 3D printing:**

- The aerospace manufacturing company Relativity Space recently launched a test rocket that was 100 feet tall and 7.5 feet wide, made entirely of 3D-printed materials.
- However, shortly after takeoff, it developed a problem.
- At the height of the Covid-19 epidemic in 2020, the healthcare industry used 3D printers to produce vital medical supplies including swabs, face shields, and masks as well as the parts to repair their ventilators.

- *Source → The Hindu*

2 – Details of Agnikul's Agnibaan space vehicle:

GS III

Science and Technology

- Chennai-based Agnikul Cosmos, a startup in the space technology industry, announced that it had flown a specifically made rocket to a Sriharikota launchpad to "commence integration checks" for an upcoming suborbital space flight.

- **Important details:**

- If the trip is successful, Agnikul will become the second Indian space technology company to launch a ship into orbit, following Hyderabad-based Skyroot Aerospace.
- The 545-kg Vikram-S rocket from Skyroot launched in 2022, marking the official start of India's private space industry.
- The company's single-stage Suborbital Tech Demonstrator (SorTeD) launch vehicle, known as Agnibaan, is propelled by Agnikul's distinctive Agnilet engine.
- Agnibaan SOrTeD will take off vertically and follow a pre-planned course.
- With a payload of up to 100 kg, Agnibaan is capable of launching one or more satellites into a low Earth orbit (LEO) of up to 700 km.

- **Engine:**

- The Agnilet engine is a single-piece, fully 3D-printed, 6 kN semi-cryogenic engine.
- A mixture of normal-temperature liquid kerosene and ultra-cold liquid oxygen serves as the engine's propellant.

- In 2021, Skyroot successfully tested the Dhawan-1, the country's first privately manufactured cryogenic engine, which was also wholly 3D printed using a superalloy and cut production time by 95%.
- **Arguments against 3D printing in spacecraft:**
 - Although it is not as scalable, engineers may iterate designs more quickly than with conventional production techniques.
 - Once a design has been established, further copies can be produced using conventional methods much more quickly.
 - 3D printing is still slow compared to planar-based manufacturing like injection moulding, which can manufacture millions of components per month.
 - Therefore, mass production is not the plan.
- **The role of the private sector in space:**
 - The government allowed the establishment of the Indian National Space Promotion and Authorisation Centre (IN-SPACe) in 2020 in order to facilitate greater business involvement in India's space operations.
 - At the time, barely 3% of the Indian sector was devoted to the rapidly growing global space economy, which was already estimated to be worth at least \$360 billion.
 - Rocket and satellite launch services made up just 2% of this industry; ground- and satellite-based systems accounted for the other 95%.
 - Indian industry was unable to compete because its main role has been to produce supporting systems and components.
 - Indian industry was unable to launch the autonomous space projects that American companies like SpaceX have been launching.
 - ISRO was unable to keep up with the growing demand for space-based services and applications, not even within India.
 - Private businesses whose projects IN-SPACe has endorsed will have access to all of ISRO's resources.
 - If ISRO offered the space, even private companies could build their own launchpad inside the Sriharikota launch facility.
- **Benefit for ISRO:**
 - There are two main reasons why more commercial involvement in the space business is important:
- **Strategic:**

- By involving the private sector, ISRO will have more time to concentrate on science, R&D, interplanetary exploration, and strategic launches.
- Currently, ISRO spends a disproportionate amount of its resources on routine chores that delay its more strategic objectives.
- **Commercial:**
 - There is no reason why ISRO should be the only one capable of launching communication or weather satellites.
 - For commercial purposes, more and more private organisations are taking control of this activity globally.
 - Additionally, ISRO, like NASA, is basically a scientific organisation whose main objectives are the accomplishment of research missions and space exploration.
 - ISRO can make some money by granting access to its resources and data to businesses.
- *Source → The Hindu*

3 – About Camp David:



GS II
International issues

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- **Context:**
 - The US president will host the leaders of Japan and South Korea for their first-ever joint summit at Camp David, a presidential retreat in the US state of Maryland.
- **In relation to Camp David:**
 - 96 km separate Camp David from Washington, DC, the US capital.
 - As part of the New Deal, it was initially built in 1938 as a camp for government employees and their families.
 - This project was intended to stimulate the economy during the early 20th century's Great Depression, a period of widespread unemployment and great poverty.
 - During the New Deal, numerous public initiatives were carried out to benefit the impoverished and give jobs in response to the financial crisis.
 - The first president to use the site was Franklin D. Roosevelt.
 - After seeing Camp David in 1942 (it was then known as Camp Hi-Catoctin), he decided to retreat there.
 - Roosevelt nicknamed Camp Hi-Catoctin "Shangri-La".

- President Dwight Eisenhower renamed the structure "Camp David" in memory of his grandson.
- Since that time, it has hosted notable individuals including British Prime Minister Winston Churchill, Soviet Premier Nikita Khrushchev, Russian President Vladimir Putin, and the whole G8 during the 2012 Summit.
- The most well-known diplomatic event, however, was the 1978 US-Egypt-Israel conference.
- **Camp David Accords:**
 - On September 17, 1978, Israel and Egypt reached a consensus at Camp David.
 - The next year, it led to the signing of a peace agreement between the two countries, the first of its type between Israel and any of its Arab neighbours.
 - The agreements became known as the Camp David Accords as a result of the negotiations taking place at Camp David, Maryland.
- **When did the Camp David Accords take place?**
 - On the one hand, it helped Israel and Egypt's relations to normalise.
 - The Egyptian-Israeli Peace Treaty was signed in 1979 in the White House.
 - Egypt was initially ejected from the Arab League organisation, but the Arab world eventually recognised it (it was later re-admitted).
 - However, a growing number of countries in the region are currently either conducting trade with Israel or establishing full diplomatic relations with it.
 - The Palestine problem has not yet been settled, though.
 - The "refugee problem"—a reference to the Palestinian war refugees—was also called for in the Accords, although little has been done to address it.
- *Source → The Hindu*

4 – Details of Air pollution and rise in antibiotic resistance:

GS III

Environmental Conservation

- All areas with considerable levels of air pollution can benefit from a study that offers fresh light on how antibiotic resistance spreads through the air.
- **Important details:**

- A recent study found a connection between antibiotic resistance and fine particulate matter (PM2.5) air pollution.
- Africa and Asia may experience the fastest increases in antibiotic resistance.
- The study offered the first global estimates of antibiotic resistance and the number of avoidable fatalities brought on by antibiotic resistance-related PM2.5 pollution.

- **The relationship:**

- Air pollution is thought to be the biggest threat to global environmental health since it causes seven million fatalities annually.
- A 10% increase in annual PM2.5 levels could lead to 43,654 additional preventable deaths worldwide and a 1.1% growth in antibiotic resistance.

- Antibiotic resistance would rise by 3% in Saudi Arabia if PM 2.5 increased by 10%.
- Niger would have an increase of 2.9%.
- Growth in the United Arab Emirates was 2.6%,
- Pakistan experienced a 2.6% rise.
- Nigeria experienced a 2.5% increase.
- India's economy expanded by 2.5%.
- Cameroon increased by 2.2%.
- Bahrain increased by 2.2%, and
- China experienced a 2.1% increase.
- China and India may be the countries with the biggest effects on premature deaths related to antibiotic resistance due to their massive populations.

- **Reduction in air pollution's effects:**

- Antibiotic resistance is expected to decrease by 16.8% if the World Health Organization's (WHO) objective of five micrograms per cubic metre (g/m³) for PM2.5 concentration is attained by 2050, and 23.4% of premature deaths attributable to antibiotic resistance are forecast to be avoided.
- \$640 billion will be saved as a result of it.

- *Source → The Hindu*

5 – About A-HELP Programme:

GS II

Government Policies and Interventions

- The government has unveiled the "A-HELP" (Accredited Agent for Health and Extension of Livestock Production) initiative and an infertile camp.
- **Important details:**
 - This approach recognises the significant contribution that women have made to the growth of the livestock industry as a whole.
 - As a part of the Pashudhan Jagrati Abhiyaan for Inclusive Development, these activities are being run by the Indian Government's Department of Animal Husbandry and Dairy.
 - Pashudhan Jagrati Abhiyaan offers farmers knowledge and resources that tackle critical problems with animal infertility, disease prevention, and livestock health.
- **Aim:**
 - The "A-HELP" initiative aims to empower women by involving them as skilled agents who significantly contribute to disease control, artificial insemination under the Rashtriya Gokul Mission (RGM), animal tracking, and livestock insurance.
- **Source** → *The Hindu*