

Current Affairs search results for tag: science-and-technology

1. India's first indigenously developed vaccine for cervical cancer launched (Sept. 1, 2022)

India's first indigenously developed **quadrivalent Human Papilloma Virus (HPV)** vaccine for the prevention of cervical cancer launched by Union Minister of Science and Technology **Jitendra Singh** in Delhi on 1 September.

IMPORTANT FACTS -

- The name of the vaccine is **CERVAVAC**.
- The Drug Controller General of India (DCGI) has given market authorization to Serum Institute of India (SII) to manufacture indigenously developed vaccine against cervical cancer.
- Cervical cancer is the second most frequent cancer in women in the age group of 15 to 44 years in India.

About CERVAVAC :

- Vaccine CERVAVAC has demonstrated robust antibody response that is approximately 1,000-fold higher based on all targeted HPV types and age groups.
- This vaccine protects women from cervical cancer.
- It has been developed by the **Serum Institute of India (SII)**.
- This vaccine will ensure the prevention of cancer caused by human papillomavirus (types 6, 11, 16 and 18).

About Cervical Cancer :

- It is a sexually transmitted infection.
- It occurs in the cells of the **cervix** (the lower part of the uterus) that connects to the vagina.
- It is mostly caused by long-term infection with **HPV**.
- It is the **second most prevalent cancer** form and the second leading cause of cancer death among women **aged 15-44**.
- Women who have HIV are six times more likely to develop cervical cancer than normal women.

Drugs Controller General of India (DCGI) :

- It comes under the **Central Drugs Standard Control Organisation (CDSCO)**.
- It is responsible for approval of licences of specified categories of drugs like blood and blood products, vaccines, IV fluids and sera in India.

- It sets the standards and quality of the manufacture, sale, import and distribution of drugs in India.

2. NASA postpones launch of Artemis 1 mission to Moon due to malfunctioning core stage engine (Aug. 30, 2022)

NASA has postponed the launch of the **Artemis 1** mission to the Moon on August 29 due to a faulty core stage engine.

IMPORTANT FACTS -

- The launch was postponed due to fuel leakage and engine problems.
- After many years of hard work, the US space agency was going to send its mission to the Moon.
- The mission is important because in view of its success, humans have to be sent to the moon in the future.
- Once launched, Artemis 1 will test the Orion spacecraft, which will orbit the Moon and one day take human crew members there.
- The cost of Artemis 1 is estimated at \$4 billion.

What is Artemis 1?

- It is named after the mythical twin sister of **Apollo, Artemis**.
- This spacecraft is the world's most powerful rocket, capable of carrying more payloads into deep space than any other vehicle.
- The first flight of the new **Space Launch System (SLS)**, Artemis 1 is a heavy-lift vehicle.
- Artemis 1 is an uncrewed mission.
- It will have three test dummies - **Helga, Zohar and Moonikin Campos** - equipped with sensors to measure vibrations, cosmic radiation and other conditions.
- During the six-week long mission, Artemis 1 and the capsule will cover a distance of about 65,000 km to the Moon.

Why was the launch postponed?

- The launch was postponed due to a fault in the RS-25 engine, which had to be mixed with liquid hydrogen and oxygen to condition it before launch.
- One of its engines was not bleeding as expected.
- The launch was postponed because the launch team was unable to resolve these issues.
- A crack was also visible on the side of the inner tank.

About Artemis 1 mission :

- For the first time in 50 years since the end of the Apollo program, the launch of Artemis 1 is an ambitious US mission to return astronauts to the surface of the Moon.
- The Artemis 1 launch will also be the first flight of NASA's 21st century moon-exploration program.
- With Artemis 1 on the surface of the Moon, NASA aims to demonstrate new technologies, business approaches and capabilities that are essential for future explorations, including Mars.

- The launch aims to further aid in the study of the Moon, its origin and history.

ISRO's Moon Exploration Mission :

- Chandrayaan 1
- Chandrayaan-2
- The Indian Space Research Organization (ISRO) recently announced India's third lunar mission **Chandrayaan-3**, which will consist of a lander and a rover.

3. NASA's James Webb Space Telescope captures new images of Jupiter (Aug. 24, 2022)

NASA has released unprecedented images of the planet Jupiter taken by the James Webb Telescope, the world's most powerful telescope, which scientists hope to give more information about the planet.

IMPORTANT FACTS -

- In this picture, many other features of the planet Jupiter have come out, usually the Great Red Spot, which looks red in color, is seen in white.
- In the picture, the brightness of the aurora i.e. Northern and Southern Lights are visible at the north and south poles of the planet Jupiter.
- Apart from this, in a wide-field picture, all parts of this planet are visible in a line.
- Its dim ring and two of its satellites i.e. the moons Amalthea andAdrastea are visible. Shining stars are visible in the galaxy behind them.

About Jupiter Planet :

- Jupiter is the largest planet in the solar system.
- Jupiter, Saturn, Uranus and Neptune are called Jovian or gas giant planets. It is composed mostly of hydrogen and helium.
- It has rings, but they're very hard to see.
- It has 79 confirmed moons.
- It is the fifth planet from the Sun, that means Mars and Saturn are Jupiter's neighbouring planets.
- It rotates once in about 10 hours (a Jovian day), but takes about 12 Earth years to complete one orbit of the Sun (a Jovian year).
- It has large storms like the Great Red Spot, which have lasted for hundreds of years.

James Webb Space Telescope :

- NASA's James Webb Space Telescope was launched by rocket on 25 December 2021 from South America's north-eastern coast.
- It is the most powerful infrared telescope ever launched by NASA.
- It has been built in collaboration with NASA, the European Space Agency (ESA) and the Canadian Space Agency.
- It has opened a new era of astronomy.
- Its goal is to search for the first galaxies that formed after the Big Bang.
- It will reveal new and unexpected discoveries, and help to understand the origins of the universe and the human position.
- It reached its destination in solar orbit about 1.6 million km from Earth after travelling 2 weeks in space.
- It is also considered a successor of the Hubble Telescope which was launched into low Earth orbit in 1990.

4. India's first observatory to be set up in Uttarakhand to monitor space activity (Aug. 24, 2022)

India's first commercial space observatory will be built in the Garhwal division of Uttarakhand by Digantara, a startup started in the field of space.

IMPORTANT FACTS -

- It will also be able to keep an eye on an object as small as 10 cm orbiting the Earth.
- With the help of this observatory, scientists will be able to keep an eye on every movement of deep space. In particular, monitoring of deep activity in geostationary, middle-Earth and high-Earth orbits will be possible.
- This observatory will also give India indigenous capability to monitor space activity on the subcontinent. For example, if Chinese satellites are observed over a particular area of India for a long period of time, it is an advantage for India to have indigenous capability without relying on countries like the US to monitor these activities.
- With the help of the information received from this observatory, collisions between satellites and other spacecraft can be avoided. A more accurate estimate can be made about their location, speed and trajectory.
- At present, the US dominates the region. It has the most such observatories to monitor space activities. Its observatories are stationed at various places and commercial companies provide inputs for them from all over the world.

Startup Digantara :

- Its full name is Digantara Research and Technology Private Limited.

- Launched in December 2018, the main focus of this startup is to track the waste being collected due to satellites in space and find solutions.
- Its headquarter is in Jalandhar, Punjab.

5. DRDO test fire indigenous Vertical Launch Short Range surface-to-air missile (Aug. 24, 2022)

Defence Research and Development Organisation (DRDO) and Indian Navy successfully flight tested Vertical Launch Short Range Surface to Air Missile (VL-SRSAM) on 23 August.

IMPORTANT FACTS -

- The missile was test fired from the Integrated Test Range at **Chandipur** off the coast of Odisha.
- The flight test was conducted from an Indian Navy ship against a high speed unmanned aerial target.
- During the test launch, flight path and vehicle performance parameters were monitored using flight data captured by various instruments such as Radar, Electro-Optical Tracking System (EOTS), and Telemetry System deployed by ITR, Chandipur.

Short Range Surface to Air Missile (VL-SRSAM) :

- It is a ship-borne weapon system capable of neutralising various airborne threats at close range, including sea-skimming targets.
- The strategy of sea skimming is used by various anti-ship missiles and some fighter aircraft to avoid detection by radar on warships.
- They fly very close to the ocean surface and thus are difficult to detect and neutralise.

Design of VL-SRSAM Missile :

- This missile is indigenously designed and developed by DRDO.
- Its design is based on Astra missile which is a Beyond Visual Range Air-to-Air missile.
- Astra is India's first air-to-air missile, developed by the Defence Research and Development Organisation.

ADDITIONAL INFORMATION -

Main features of VL-SRSAM Missile :

- It has two key features - cruciform wings and thrust vectoring.

- The cruciform has four small wings arranged like a cross on all four sides and provides a stable posture to the projectile.
- Thrust vectoring, on the other hand, helps to change the angular velocity from its engine and the direction of thrust that controls the missile.
- The missile weighs 154 kg and its length is about 12.6 feet.
- It is designed to strike high-speed air targets at a range of 40 to 50 km and at an altitude of about 15 km.

6. Tomato flu spreading in India - Lancet warns (Aug. 23, 2022)

Following the COVID-19 pandemic and the ongoing monkeypox, the Lancet has warned India about a new infectious disease, Tomato Flu or Tomato Fever.

IMPORTANT FACTS -

- It was first identified in the Kollam district of Kerala on May 6, 2022.
- On July 26 in local government hospitals, more than 82 children under the age of 5 have been confirmed to be infected with the disease.
- This endemic viral disease has put the neighbouring states of Tamil Nadu and Karnataka on alert.
- In addition, 26 children (1-9 years of age) have been confirmed for the disease by the Regional Medical Research Centre, Bhubaneswar in Odisha.

What is Tomato Flu ?

- It is a rare viral disease that causes red blisters, skin irritation and dehydration.
- The blisters that occur in this disease look like a tomato, hence it is called tomato flu.
- It is a form of hand, foot and mouth disease (HFMD).
- It is caused by **Coxsackie virus A 16**. It belongs to **Enterovirus family**.
- The disease is rare in adults because they usually have an immune system strong enough to defend against the virus.

Symptoms of the disease :

- Blisters
- Diarrhoea
- Dehydration
- In some cases, the discoloration of the hands and knees also fades.

Treatment of the disease :

- It is a self-limiting disease and there are no specific drugs for it.
- It is similar to chikungunya and dengue, utensils, clothes and other items used by the infected persons must be sanitised to prevent the flu from spreading.
- Fluid intake should be increased to counter dehydration.

7. New species of bent-toed gecko found at Agasthyamalai (Aug. 22, 2022)

A group of researchers has discovered a new species of bent-toed gecko from Agasthyamalai hills in the Western Ghats recently.

IMPORTANT FACTS -

About the new Species :

- Scientific name - *Cyrtodactylus aravindi*
- The species has been given the common name Aravind's ground gecko after noted malacologist (a branch of zoology that deals with molluscs) N A Aravind.
- It has been described on the basis of variation and its specificity in molecular DNA data.
- It has so far been found only at two locations, Muppanddal and Thuckalay, in Kanyakumari district within the Agasthyamalai biosphere reserve in Tamil Nadu.
- This new species has been described in the journal *Vertebrate Zoology*.

About Gecko :

- Geckos are reptiles and are found on all continents except Antarctica.
- These are colorful lizards adapted to habitats ranging from rainforests, deserts to cold mountain slopes.
- Most geckos are nocturnal, they are active at night.

Agasthyamalai Biosphere Reserve :

- **It was established in 2001.**
- It straddles the border of Kollam and Thiruvananthapuram Districts in Kerala and Tirunelveli and Kanyakumari Districts in Tamil Nadu, South India at the southern end of the Western Ghats.
- It consists mostly of tropical forests.

8. Researchers develop 3D printed artificial cornea (Aug. 16, 2022)

A team of researchers from Hyderabad have successfully 3D-printed an artificial cornea and transplanted it into a rabbit eye for the first time in the country.

Important facts

- This 3D printed cornea has been made by scientists from LV Prasad Eye Institute (LVPEI), IIT Hyderabad (IITH) and Centre for Cellular and Molecular Biology (CCMB).
- This cornea is made from the corneal tissue of the human eye.
- This cornea has been completely made by the country's scientists with indigenous technology.
- It does not contain any synthetic components and can be applied to patients as well.

How was the 3D cornea made?

- Scientists have created a biomimetic hydrogel by extracting decellularized corneal tissue and stem cells from the human eye.
- Scientists have said that this 3D printed cornea has been prepared from the corneal tissue of the human eye, so it is completely biocompatible and natural.
- This will be helpful in treating diseases like corneal scarring (in which the cornea becomes opaque) and keratoconus (in which the cornea becomes thin).
- Many times the cornea of army soldiers gets damaged due to injury, in such a situation the light of those soldiers can be brought back with 3D printed cornea.

What is Cornea?

- The cornea is the transparent part of the eye that covers the front of the eye.
- It covers the pupil (the centre of the eye), iris (the colored part of the eye), and anterior chamber (the fluid-filled inside of the eye).
- The main function of the cornea is to refract or bend light.
- The cornea is responsible for focusing most of the light that enters the eye.

What is 3D Printing?

- 3D printing uses computer aided design (CAD) to create three-dimensional objects through the layering method.
- The model to be printed with the help of software is first developed by the computer, which then instructs the 3D printer.

9. Union Minister Dr Jitendra Singh unveils India's first Saline Water Lantern (Aug. 13, 2022)

Union Minister of State (Independent Charge) Science & Technology, Dr Jitendra Singh on 13 August launched India's first Saline Water Lantern.

About Saline Water Lantern

- It uses the sea water as the electrolyte between specially designed electrodes to power the LED lamps.
- It is the first-of-its kind lantern named "**Roshni**".
- The Roshni Lamp has been invented by the National Institute of Ocean Technology (NIOT), Chennai.
- This technique can also be used in areas where sea water is not available, as any saltwater or normal water mixed with common salt can be used to power lanterns.

Significance

- It will bring "ease of living" to the poor and needy, especially the fishing community living along India's 7500 km long coastline.
- It will also give a boost to and complement Prime Minister Narendra Modi's UJALA scheme launched in 2015 for the distribution of LED bulbs across the country.
- It is not only cost-effective, but very easy to operate.

10. PM Modi dedicate to nation 2nd Generation Ethanol Plant at Panipat in Haryana (Aug. 10, 2022)

Prime Minister Narendra Modi dedicated to the nation the 2nd Generation (2G) Ethanol Plant at Panipat in Haryana on 10 August.

Important facts

- This is part of a long series of steps taken by the government over the years to promote the production and use of biofuels in the country.
- This is in line with the Prime Minister's efforts to make the energy sector more affordable, accessible, efficient and sustainable.

About the Plant

- It has been built at an estimated cost of over Rs 900 crore by Indian Oil Corporation Ltd (IOCL).
- It is located close to the Panipat Refinery.
- The project will use about two lakh tonnes of rice straw (straw) annually to generate about 30 million litres of ethanol annually.

- Farmers will be empowered for better use of agro-crop residues and additional income generation opportunities will be provided to them.
- The project will have zero liquid discharge.
- Reduction in burning of rice straw (stubble) will reduce carbon dioxide emissions by about 3 lakh tonnes per year and reduce greenhouse gases.

About ethanol

- Ethanol is a kind of alcohol, it is also called ethyl alcohol.
- It can be used as fuel in vehicles by mixing it with petrol.
- After sugarcane, the central government is now focusing on preparing ethanol from rice.
- By producing ethanol, farmers can make their economic condition better by earning good profits.
- Ethanol is mainly produced from the sugarcane crop, but it can also be prepared from different types of sugar crops.

Ethanol blending programme (EBP) in India

- Under this programme 5 per cent ethanol-blended petrol will be supplied to retail outlets.
- It aims to popularize 5 per cent ethanol-blended petrol in 9 states and 4 union territories.
- Its aim is to reduce the country's dependence on crude oil imports, cutting carbon emissions and boosting farmers' incomes.