

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

### **1. Russia test-fires 'world's most powerful' nuclear-capable missile ( April 21, 2022 )**

Nearly two months after invading Ukraine, Russia tested the **Sarmat missile**, a new nuclear-capable intercontinental ballistic missile.

- The test was conducted in Palestek, in the southwestern part of Russia.
- After the test, Russian President Vladimir Putin said that this missile will make Russia's enemies stop and think.
- The Sarmat missile is a new nuclear-capable intercontinental ballistic missile.
- It was test-launched for the first time from Plesetsk in northwest Russia and hit targets in the Kamchatka peninsula, nearly 6,000 km (3,700 miles) away.
- The missile weighs more than 200 tonnes and can transport more than ten warheads.
- As per Russian media, Sarmat is a three-stage, liquid-fueled missile with a range of 18,000 km.
- The missile is 35.3 metres long and 3 metres in diameter.
- The long-range missile has been in the works since the 2000s.
- Russia's nuclear forces will start taking delivery of the new missile "in the autumn of this year" once testing is complete.
- It is among Russia's next-generation missiles that Putin has called "invincible," and which also include the Kinzhal and Avangard hypersonic missiles.
- It has the highest tactical and technical characteristics and is capable of overcoming all modern means of anti-missile defence.
- The missile can hit any target on Earth.

### **2. Rajasthan becomes first State to get L-root server ( April 19, 2022 )**

Rajasthan has become the first State in the country to get the L-root server, which will enable the State government to provide its flagship digital services and enforce e-governance with seamless internet connectivity.

- The new facility will strengthen internet infrastructure and help improve security and resilience of internet-based operations.
- The server, installed at the Bhamashah State Data Centre, has been installed by the government in association with the Internet Corporation for Assigned Names and Numbers (ICANN).
- After its installation, even if there is a problem in internet connectivity due to any technical fault or natural calamity in the whole of Asia or India, it will continue to run without any interruption in Rajasthan.

- Along with this, high speed internet connectivity will also be ensured.
- The state government in the State is delivering digital services to the people through e-Mitra, Jan Aadhaar Yojana, Jan Kalyan portal, Jansuchna portal and various mobile phone apps.
- There are at present three J-root servers in New Delhi, Mumbai and Gorakhpur and two L-root servers in Mumbai and Kolkata.
- The L-root server in Rajasthan is the first one deployed at the State level.

### **3. India-made 'warm' vaccine to fight COVID-19 ( April 16, 2022 )**

A vaccine against SarsCov2 being developed in India, that doesn't need to be stored in refrigerators or a cold-chain storage, generated a significant number of antibodies in mouse trials against prevalent variants of the virus.

- The 'warm' vaccine developed by the Bengaluru-based Mynvax laboratories which is a company incubated at the Indian Institute of Science Bangalore.
- The 'warm' vaccine can be stored at 37 degree Celsius for four weeks and at 100 degree Celsius for upto 90 minutes.
- Most other vaccines require to be stored in refrigerators and can be kept at room temperature for no more than a few hours.
- Scientists around the world are working on developing heat-tolerant vaccines.
- A new 'warm' vaccine that does not require refrigeration.
- Results have shown a strong immune response in mice to SARS-CoV-2, the virus that causes COVID-19.

### **4. India To Build Nuclear Power Plants In "Fleet Mode" From 2023 ( March 28, 2022 )**

The Government of India plans to start construction of ten 'fleet mode' nuclear reactors over the next three years, with the first pour of concrete for a 700 MW atomic power station in Karnataka's Kaiga slated for 2023.

Under the fleet mode, a nuclear power plant is anticipated to be built over a period of five years from the first pour of concrete(FPC).

- The first pour of concrete (FPC) marks the beginning of construction of nuclear power reactors from the pre-project stage which includes excavation activities at the project site.
- The officials of the Department of Atomic Energy informed the Parliamentary panel on science and technology that the " FPC of Kaiga units 5&6 is expected in 2023; FPC of Gorakhpur Haryana Anu Vidyut Praiyonjan units 3 & 4 and Mahi Banswara Rajasthan Atomic Power Projects units 1 to 4 is expected in 2024; and that of Chutka Madhya Pradesh Atomic Power Project units 1 & 2 in 2025".

- The Centre had approved construction of 10 indigenously developed pressurized heavy water reactors (PHWR) of 700 MW each in June 2017. The ten PHWRs will be built at a cost of Rs 1.05 lakh crore.
- The PHWRs, which use natural uranium as fuel and heavy water as moderator, have emerged as the mainstay of India's nuclear power programme.
  - India's first pair of PHWRs of 220 MW each were set up at Rawatbhata in Rajasthan in the 1960s with Canadian support.
  - As many as 14 PHWRs of 220 MW each with standardized design and improved safety measures were built by India over the years. Indian engineers further improvised the design to increase the power generation capacity to 540 MWe, and two such reactors were made operational at Tarapur in Maharashtra.

**For additional information on Nuclear power, kindly see the 24 March 2022 post.**

### **5. Oxygen Plus - Smartphone-based portable oxygen kit ( March 25, 2022 )**

An easy to handle and transport, multi-modal, smartphone-based, field-portable oxygen concentrator called Oxygen Plus was designed by GRS India, a Department for Promotion of Industry and Internal Trade (DIPP) Government of India, recognized start-up.

The device can be used by for oxygen support during medical emergencies, trauma as well as disasters to protect people from the risk of breathing contaminated air.

### **6. No country met WHO air quality standard in 2021 ( March 22, 2022 )**

Not a single country managed to meet the World Health Organisation's (WHO) air quality standard in 2021. In a survey conducted in 6475 cities in 117 countries by IQAir, a Swiss pollution technology company, showed that pollution and smog has increased in some cities of the world after a COVID-related dip.

The IQAir's annual World Air Quality Report 2021 was released on 22 March 2022.

The WHO recommends that average annual readings of small and hazardous airborne particles known as PM<sub>2.5</sub> should be no more than 5 micrograms per cubic metre.

But only 3.4% of the surveyed cities met the standard in 2021,

As many as 93 cities saw PM<sub>2.5</sub> levels at 10 times the recommended level.

### **Highlights of the IQAir's annual World Air Quality Report 2021**

It has ranked the country on the basis of average PM<sub>2.5</sub> concentration (micrograms per cubic metre).

Most Polluted Country in the world ( in descending order) , Pm 2.5 concentration (micrograms per cubic metre)

1. Bangladesh 76.9
2. Chad 75.9

- Pakistan 66.8
- 3.
4. Tajikistan 59.4
5. India 59.1

**Least polluted country/territory in the world (New Caledonia) 3.8****Most Polluted Capital city ( in descending order),micrograms per cubic meter**

1. New Delhi 85.00
2. Dhaka (Bangladesh ) 78.1
3. N'Djamena (Chad) 77.6
4. Dushanbe(Tajikistan) 59.5
5. Muscat(Oman ) 53.9

Least polluted capital city Noumea(New Caledonia ) 3.8

**Most Polluted City in the world (in descending order)**

1. Bhiwadi (Rajasthan )
2. Ghaziabad (Uttar Pradesh)
3. Hotan (China)

**Kindly also see 7 March 2022 post on Air Pollution and PM 2.5****Important for Exam****World Health Organisation (WHO)**

It is a specialised agency of the United Nations .

It was set up on 7 April 1948

Headquarters : **Geneva , Switzerland**

Director General of WHO: **Tedros Adhanom Ghebreyesus of .Ethiopia**

**7. Country's first Artificial Intelligence & Robotics Technology Park launched in Bengaluru ( March 15, 2022 )**

The country's first Artificial Intelligence & Robotics Technology Park (ARTPARK) was launched in **Bengaluru** on 14 March 2022. It is promoted by a not-for-profit foundation set up by the Indian Institute of Science (IISc) Bengaluru.

- The Park has been set up with a capital of Rs 230 crore out of which the central government contribution is Rs 170 crore and the Karnataka government contribution is Rs 60 crore.

- The ARTPARK will work on creating a globally leading Artificial Intelligence (AI) and Robotics Innovation ecosystem in the country.

### **Indian Institute of Science (IISc)**

- The Indian Institute of Science was set up in 1909 at **Bengaluru, Karnataka** by a partnership between the industrialist JRD Tata, the Mysore royal family and the Government of India.
- IISc is India's premier institute for advanced scientific and technological research and education.
- In 2018, IISc was selected as an Institution of Eminence (IoE) by the Government of India.

### **8. Petascale Supercomputer “PARAM Ganga” established at IIT Roorkee ( March 9, 2022 )**

The **National Supercomputing Mission** has installed the Petascale Supercomputer “**PARAM Ganga**” at **IIT Roorkee** with a supercomputing capacity of 1.66 Petaflops.

- The National Supercomputing Mission (NSM) is a joint project of **Ministry of Electronics & Information Technology (MeiTY) and the Department of Science and Technology (DST)** and it is being implemented by Centre for Development of Advanced Computing (C-DAC) and Indian Institute of Science (IISc), Bangalore.
- The National Supercomputing Mission was launched to enhance the research capacities and capabilities in the country by connecting them to form a Supercomputing grid, with National Knowledge Network (NKN) as the backbone.
- The Mission plans to build and deploy 24 facilities with cumulative compute power of more than 64 Petaflops. Till now C-DAC has deployed 11 systems at IISc, IITs, Indian Institute of Science and Education Research(IISER) Pune, Jawaharlal Nehru Centre for Advanced Scientific Research( JNCASR) Bengaluru, National Agri-Food Biotechnology Institute (NABI),Mohali and C-DAC.

### **Important Information**

- The fastest supercomputer in the world is the **Fugaku supercomputer** located at RIKEN Centre for Computational Science in Kobe, Japan. It has a computing speed of 415.5 petaflops.
- The fastest supercomputer in India is **Param Pravega** at the Indian Institute of Science (IISc), Bengaluru It has a supercomputing capacity of 3.3 petaflops

### **Petaflops**

- It refers to the computer which has a capability to calculate at least  $10^{15}$  floating point operations per second.

**9. Microsoft unveils fourth data center in India ( March 8, 2022 )**

American multinational company Microsoft will set up its fourth data centre in Hyderabad, Telangana. It is being set up with an investment of Rs 15,000 crore over 15 years.

- The data centre will become operational by 2025.
- Microsoft set up its first data centre in India in 2015 and at present its data centre is operational in **Mumbai, Pune and Chennai**.
- It will offer the entire Microsoft portfolio across the cloud, data solutions, artificial intelligence (AI), productivity tools, and customer relationship management (CRM) with advanced data security, for enterprises, start-ups, developers, education, and government institutions.
- This will help customers in India thrive in a cloud and AI-enabled digital economy.

**10. 93% of Indian lives in high air pollution areas ( March 7, 2022 )**

The United States based Health Effect Institute (HEI) in its Annual report “State of Global Air analysis for the year 2020” has found that around 93% of the Indian population lives in areas where the air pollution is seven times the World Health organisation (WHO) standards.

**Major highlights of the report**

- 93% of the Indian population is exposed to air containing at least 35µg/m<sup>3</sup> concentration of PM<sub>2.5</sub> (particulate matter of the size of 2.5 microns). According to the WHO standards, the upper annual limit for PM<sub>2.5</sub> is 5µg/m<sup>3</sup>.
- Due to high exposure to air pollution, Indians have on an average loose 1.51 years of their life.
- The large exposure to PM<sub>2.5</sub> has also reduced life expectancy for countries and regions—Egypt (2.11 years), Saudi Arabia (1.91 years), India (1.51 years) China (1.32 years) and Pakistan (1.31 years).
- Almost 100% of the world population lives in areas where the PM<sub>2.5</sub> levels exceeded WHO recommendations.
- India was ranked as the ninth most exposed country to Ozone after Congo, Ethiopia, Germany, Bangladesh, Nigeria, Pakistan, Iran and Turkey.
- The lowest impacts of pollution on longevity is in Norway, Sweden, Australia, and New Zealand.

**Concept Clearing****PM or Particulate Matter 2.5 and PM 10**

- Particulate matter is composed of a mixture of solids and liquids found in the air. It comprises dust, dirt, soot, etc.
- PM or particulate matter, in simple words, refers to small particles of dust

- Dust particles are graded by measuring their diameter in microns. The most important types of particulate matter are PM<sub>2.5</sub> and PM<sub>10</sub> from a public health perspective.
- PM<sub>2.5</sub> has a diameter of 2.5 microns and PM<sub>10</sub> has a diameter 10 microns.
- It enters into lungs and causes respiratory diseases like asthma, bronchitis etc.