TARGET PRELIMS 2024
BOOKLET-55
CURRENT AFFAIRS UPDATES

1. TABLE OF CONTENTS

2. S&T:

1) SPACE:

A) 55 CANCRI E (OR JANSSEN)

- It is an underlined exoplanet discovered recently. It is the **first rocky planet outside our solar system** which has an atmosphere.
- It is located in our **Milky Way Galaxy** about **41 light years from Earth**, in the constellation **Cancer**.
- It is a '**super earth**' – significantly larger than earth – and it orbits perilously close (1/25th of AU) to a star dimmer and slightly less massive than Sun, rapidly completing an orbit in about 18 hours.
- It is inhospitable with surface temperature of about 1725 degree Celsius. This is one of the hottest known exoplanets.
- **Why atmosphere is crucial**?
  - » It is essential for any possibility for harboring life.

2) HEALTH: FLIRT – THE NEW COVID-19 VARIANT (MAY 2024)

- **FLiRT** is the nickname of the new coronavirus **variant called KP.2**
  - » **Understanding the connection of KP.2 with Omicron**:
    - ▫ **Omicron** was a variant of SARS-COV-2 that took hold in the US in 2021. It spawned many subvariant including **JN.1**, which was identified in Sep 2023. JN.1 has many descendants, one of them being **JN.1.11.1**. **FLiRT/KP.2 is a variant/Spinoff of JN.1.11.1**.

- **Why this nickname?**
  - » **FLiRT** is based on the **letters representing two immune escape mutations** that allows virus to evade antibodies.
    - ▫ These two mutations on the spike protein disrupt the major sites on the spike protein where antibodies bind and neutralize the SARS-CoV-2 virus. These mutations allow the virus to escape antibodies.
    - ▫ The mutations in the Spike Protein of KP.2 are at **R346T, F456L, and V1104L**.

- It has been linked to rising cases of COVID-19 in the US, UK, and South Korea.
  - » In India, KP.2 sequence made up 29% of Covid-19 sequences uploaded by India to the Global Initiative on Sharing All Influenza Data (GISAID), the world's largest repository of these sequences, over the last 60 days.

- FLiRT is characterized by its **ability to evade immunity** from vaccines and previous infections.
  - » **Symptoms** are similar to earlier variants.
    - ▫ The US Centers for Disease Control and Prevention (CDC) notes that there are currently no indicators suggesting that KP.2 would cause more severe illness than other strains.
  - » **However, KP.2 can drive-up infection**: It has heightened transmission rate, and, like its parent JN.1, it is likely to drive a wave of infections.

- **Can booster shots of Covid-19 vaccines help here?**

- » Most Covid-19 vaccines available in India are <u>aimed at the original variant of virus</u>, so additional shots are <u>unlikely to help</u>.
  - » **How vaccine should be modified?**
    - ▫ In late April, the WHO's Covid vaccine advisory group advised the use of <u>JN.1 lineage as the antigen for upcoming vaccine formulation</u>, as the <u>FLiRT variants are within JN.1 family</u>. However, vaccines in <u>India are not updated yet</u>.

3) COMPUTER AND IT: ARTIFICIAL GENERAL INTELLIGENCE (AGI)

- **Artificial General Intelligence** is a theoretical AI system with <u>capabilities that rival those of a human</u>. It will be able to <u>perform any intellectual task that a human can</u> and perhaps even surpass human abilities in the area.
  - o When AI's abilities are indistinguishable from those of a human, it will have passed what is known as <u>Turing Test</u> first proposed by 20th century computer scientists Alan Turing. So far, **no AI tool** has passed <u>Turing Test</u>.
  - o **Alan Turing,** widely considered the <u>father of theoretical computer science and artificial intelligence</u>, introduced what is known as <u>Turing Test</u> – a benchmark for machine intelligence. In simple words, **if a Machine can engage in a conversation with a human without being detected as a machine**, according to the Turing Test, it has <u>demonstrated human intelligence</u>.

- **How is it different from Current AI System?**
  - o **Current AI systems** (also known as **narrow AI)** are designed for <u>specific task</u> like image recognition, natural language processing, translation, playing games like chess etc. But this AI remain <u>limited to set parameters</u>.
  - o **AGI** envisions a <u>more general and broader from of intelligence</u>, not confined to only limited tasks. They will be able to <u>solve problems, adapt to new situations, and learn new skills in a way that is similar to how humans learn</u>. This would require AGI to <u>possess self-awareness and consciousness,</u> as well as ability to reason, plan, and make decisions.

- **How close are we in achieving AGI?**
  - o Scientists believe that <u>we are **decades away**, if not centuries</u>.

- **How will AGI benefit humans?**
  - o By solving some unsolvable problems in the field of:
    - ▪ **Health:** By integrating and analyzing vast data it can <u>redefine diagnostics, treatment planning</u> etc. far beyond the capability of humans.
    - ▪ **Finance and Business**: AGI could automate <u>various processes and enhance the overall decision making.</u>
    - ▪ Education: AGI could transform <u>adaptive learning systems</u> that work towards the unique needs of students. This could potentially <u>democratize access to personalized education worldwide</u>.

- **AGI** will also be associated with potential risk:
  - o **Environmental Risks** associated with <u>humongous amount of computation power</u> required to develop AGI.
  - o **Job displacement** and <u>economic disruption</u> -> increase inequality
  - o **Weaponization of AI tech**
  - o **Loss of control over AI system**
  - o **Existential risk for humans ->** Situation where AGI becomes <u>too independent</u>, so much so that <u>humans simply lose control</u>.

4) HEALTH/BIOTECHNOLOGY: XENOTRANSPLANTATION

- **Why in news?**
    - In Jan 2022, doctors replaced the heart of a 57-year-old patient with the heart of a genetically modified altered pig. However, the patient died two months after the transplant. This was an experimental procedure that was done after US FDA granted emergency authorization for it on 31st Dec 2021.

- **Xenotransplantation** is "any procedure that involves the transplantation, implantation, or infusion into a human recipient of either (a) live cells, tissues or organs from a nonhuman animal source, or (b) human body fluids, cells, tissues or organs that have had ex vivo contact with live nonhuman animal cells, tissues or organs.
    - It is seen as an alternative to the clinical transplantation of human organs which is in shortage due to demand-supply issues.
    - It was first tried in 1980s in USA. A well known case is of Baby Fae, who was born with a congenital condition defect and who received a baboon heart in 1984. This baby died in few months after the body's immune system rejected the baboons heart.
    - First kidney transplant from pig to human happened in March 2024 and the patient died in May 2024.

- **Why Xenotransplantation is being explored?**
    - Can provide an alternative supply of organs.

- **Why Pig Heart is being used in several cases of Xenotransplantation?**
    - Pig Heart Valves have been used for replacing damaged valves in humans for over 50 years.
        - There are several advantages of using domesticated or farmed pig as the donor for xenotransplantation.
            - **The Pig's anatomical and physiological** parameters are similar to that of humans.
            - **Breeding** of pigs of different varieties is widespread and cost effective. It provides an opportunity for the size of harvested organ to be matched with the specific needs of human recipient.
            - **Pigs** have shorter lifespan allowing for quick production of new organs when needed.

- **Why are Pigs genetically engineered to use their organ (heart, kidney etc)?**
    - The molecular incompatibility between pigs and humans can trigger **several immune complications after the transplant**. Therefore, genetic engineering is used to **tweak the genome** of the pig so as to 'disguise it', so that immune system of the human recipient fails to recognize it, and the reactions that lead to xenograft rejection are not triggered.
        - **For e.g: Pigs** have a gene for **Alpha-gal (a sugar molecule)** which can elicit a devastating immune response in humans. So, the gene which codes for Alpha-gal is removed to make **'GalSafe'** pig. These GalSafe pigs are well studied and are approved by USFDA for use in pharmacology.

5) NANOTECHNOLOGY: GOLDENE – A SHEET OF GOLD WHICH IS ONLY ONE ATOM THICK

For the <u>first time scientists have created</u> a free standing sheet of gold that is <u>only one atom thick</u>. (May 2024)

These sheets of goldene are <u>roughly 100 nanometers thick</u>, approximately 400 times thinner than the thinnest commercially available gold leaf.

It has been <u>developed by scientists from</u> **Sweden's Linkoping University**.

» Since the <u>development of Graphene in 2004</u>, scientists have created **hundreds of 2D material**. But, **coming up with atom-thin metallic sheets** has been a challenge, due to **metal's tendency to cluster together** to make nanoparticles instead.

» **Goldene is the first free-standing 2-D metal**.
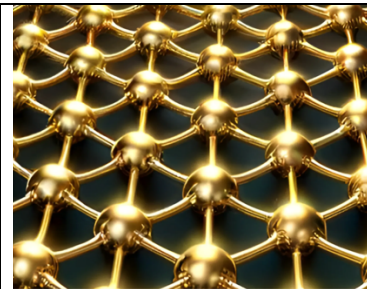
- **How was Goldene formed?**
    » Researchers <u>first sandwiched an atomic monolayer of silicon between</u> **layers of titanium carbide**.
    » Then they <u>deposited gold on top of this sandwich structure</u>, the gold atoms diffuse into the material and replace the silicon atoms, <u>forming a trapped monolayer of gold atoms</u>.
    » Subsequently, <u>scientists etched away the titanium carbide layers</u> to create a free standing, one atom thick layer of gold. This was done with the help of an **age-old Japanese technique** used to forge <u>Katanas and high-quality knives</u>, using a chemical popularly known as **Murakami's reagent**.

- **Applications/Advantages:**
    » It can **revolutionize electronics industry** – Electronics which use gold due to electrical conductivity, can potentially use lesser amounts for the same purpose.
    » **Great Catalyst**: Goldene holds promise of a <u>great catalyst because its much more</u> **economically viable** than thicker, three-dimensional gold.
    » **Method used to make goldene** can be used to (theoretically) make other 2-D metal sheets.
    » **Other special properties** – Like other 2-D materials, goldene will have some other special properties. This is because <u>each gold atom</u>, in this case, has <u>only six neighbouring atoms</u>, compared to <u>12 in a three-dimensional crystal</u>.
    » These special properties and applications are being explored.

6) PHYSICS: MAGNETIC RESONANCE IMAGING (MRI): KEY COMONENTS AND FUNCTIONS

- **What is Magnetic Resonance Imaging?**
    » It is a <u>medical imaging technique</u> that is used to obtain <u>detailed picture of</u> **soft tissues** <u>within the body</u>. It is a <u>non-invasive diagnostic procedure</u> widely used to image the brain, the cardiovascular system, the spinal cord and joints, various muscles, the liver, arteries, etc. It is particularly important in the observation and treatment of <u>certain cancers</u> including Prostate and rectal cancer, and to track <u>neurological conditions</u> like Alzheimer's, dementia, epilepsy, and stroke.
    » It is also used to observe <u>changes in the blood flow</u> to infer the way the activity of neurons is changing in the brain. In this form the <u>technique is called</u> **functional MRI**.
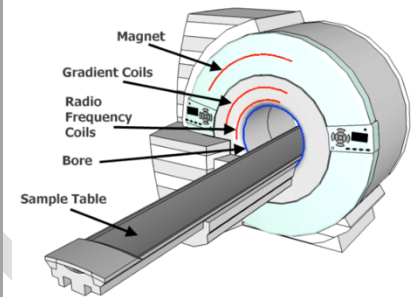
- **2003 Medicine Nobel Prize**:

» The underlying techniques of MRI was worked in 1970s; In the same decade, <u>Paul Lauterbur and Peter Mansfield</u> refined the techniques to <u>pave the way for their commercial use</u>. For these efforts, they were awarded the <u>Medicine Nobel Prize in 2003</u>.

- **How does MRI work?**
  » MRI scan reveals an image of a body part using the <u>Hydrogen atoms in that part</u>. In normal times, these atoms are all spinning, with axes pointing in random direction.
  » **Four components of MRI Machine:**
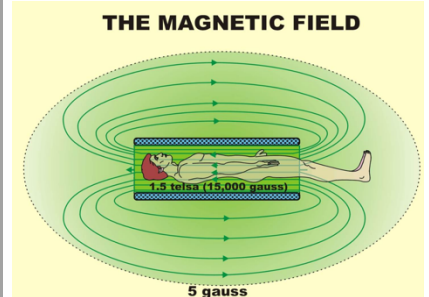
The Machine looks like a giant donut which has a hole in the center called the **bore**. It is where the person whose body is to be scanned in inserted.	
A Powerful Superconducting Magnet: It's job is to produce <u>powerful and stable magnetic field around the body</u>. Each hydrogen atom has a powerful magnetic moment, <u>which means in the presence of a magnetic field, the atom's spin axis will point along the field's direction</u>. **Other than big powerful magnetic field**, the MRI machine activates **three magnets** that produce <u>smaller magnetic field</u> that are weaker than the main field by about 80 times. These fields also have <u>gradient</u> i.e. they are not uniform. These fields interfere with the main field at the part to be scanned such that <u>resulting field highlights very specific portions</u>, which can be the focus of the scan.	
<u>**Device that emits Radio Frequency Pulse**</u> at the part under the scanner. These radio waves nudge the protons out of alignment. When the radio pulse go 'off' these hydrogen atoms (protons) realign themselves with the magnetic field, releasing <u>energy in the process</u>. This released energy is detected by the MRI machine detector.	
Detector: The detector receives the emissions and converts them to signals, which are sent to a computer that uses them to recreate two- or three-dimensional images of the part of the body.	
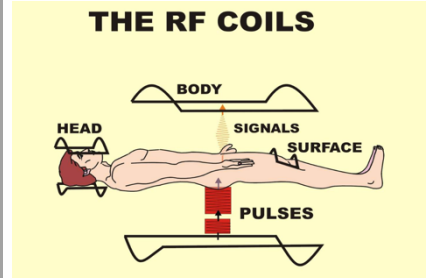
P a g e 5 | 17

- **Advantages of MRI**:
    - » **MRI scan** can practically image the body from all useful direction and, if required, in very small increments.
        - » They **don't pose any threats**; **Unlike X-Rays** and **CT scans,** MRI's don't use ionizing radiation.
        - » **However, a scan's effect on pregnant ladies are not well studied** and therefore many scanning facilities simply refuse such appointments.
- **Limitations**:
    - » **Expensive**: Depending on features, they may cost from a few tens of lakhs to crores of rupees. This leads to high cost of MRI for patients.
    - » **Claustrophobic** people may find it difficult to remain inside (though some 'open bore' MRI machine designs can alleviate this issue)
    - » **High Energy Consumption**: heavy currents are passed through the coil
    - » A **strong magnetic field** prevents individuals with embedded metallic objects, shrapnel, metallic implants, including pacemakers from going for MRI Scan. This magnetic field can wipe the magnetic strip of a credit card.

- **MRIs vs X-Rays**:
    - » **MRIs** are better suited for soft tissues, and they don't show up on X-rays. **X-rays** are better suited for bone fracture detection.
    - » **MRIs** may detect bone fracture, but they are not as clear as X-Rays. Further, X-rays are cheaper, making them ideal for initial fracture diagnosis.
    - » **MRIs are more expensive and time consuming** than X-Rays.
    - » **MRIs** can however be used for detecting hidden fractures which X-rays can't detect. This is especially true for hairline fracture, stress fracture etc.

7) DEFENCE: INDIGENOUS TECHNOLOGY CRUISE MISSILE (ITCM)

- In April 2024, **DRDO** conducted a successful **flight test** of Indigenous Technology Cruise Missile (ITCM) from the Integrated Test Range (ITR), Chandipur off the coast of Odisha.
    - » It is a **long-range subsonic cruise missile** powered by indigenous propulsion.
    - » Missile has been developed by Bengaluru based DRDO laboratory **Aeronautical Development Establishment (ADE)** along with contribution from other laboratories and Indian industries.
    - » The missile used **Indigenous propulsion system** developed by Gas Turbine Research Establishment (GTRE), Bengaluru.

8) DEFENCE: SUPERSONIC MISSILE ASSISTED RELEASE OF TORPEDO (SMART)

- It is a canister based, long range supersonic **anti-submarine missile** developed by DRDO for Indian Navy.
    - ▫ It consist of a long **range missile carrier (640 km)** which can travel and supersonic speed and a **lightweight torpedo (50 kg, 20 km)** as payload for anti-submarine warfare (ASW) role.
- It can be launched from surface ship or a truck based coastal battery.
- It was launched jointly by **Defence Research Development Laboratory (DRDL)** and **Research Centre Imarat (RCI)**.
- **On 1st May 2024**, it was successfully tested from Dr APJ Abdul Kalam Island off the coast of Odisha.

1) PLANT BIODIVERSITY

A) SEMAL TREE (BOMBAX CEIBA L.)
- **Why in news?**
  - » Semal trees are disappearing from South Rajasthan because of it being burned during Holi Festival (Holika Dahan) (March/May 2024)
- **Details**

Semal (local name in Rajasthan), **cotton tree** (more specifically **Malabar Silk-Cotton Tree**; Red Silk Cotton; Red Cotton Tree;) is an Asian tropical tree.

IUCN: LC

Significance of the tree:
- It's roots, fruits, seeds, stem, stem bark, and gum are all medicinally significant.
- It also plays a crucial role in forest ecosystem:
  - The rock bees nestle on its branches because the tree's spikes keep its predator, the sloth bears, away.
  - Members of tribal communities consume the tree's reddish root for food during the monsoons.
  - Larvae of the moth *Bucculatrix crateracma* feed on its leaves.
  - **The golden-crowned sparrow weaves the lining of its nests with white cotton** from its seeds.
  - The Dysdercus bugs, the Indian crested porcupine, Hanuman langurs, and some other species feast on the nectar in its flowers

In some parts of Rajasthan, it has been traditionally used for **Holika Dahan** festival. Traditionally the debarked stem or branch of a semal tree is used as the bonfire's main pillar.

Is this cutting not illegal?
The cutting violates a panoply of laws, from Rajasthan Forest Act 1953 to the Forest (Conservation) Act, 1980.

Where is the tree found?
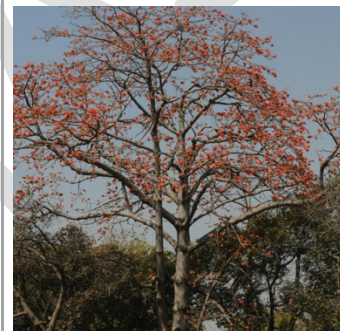
Flower

Seeds

4. SOCIAL JUSTICE: HEALTH:

1) OPERATION AMRITH – TO TACKLE ANTI-MICROBIAL RESISTANCE

- By Kerala Government
- **AMRITH –** (Antimicrobial Resistance Intervention for Total Health)
- Implements the original H1 rule which requires a doctor's prescription for purchase of any class of anti-biotics.
  - **Original H1 Rule of 2011**: It prohibited OTC sales of antibiotics without prescription
  - **Modified H1 Rule of 2013**: It restricts OTC sale of 2nd and 3rd line of anti-biotics. This modification aims to ensure accessibility to life saving anti-biotics, particularly in remote areas where access to doctors may be limited.
- Under it, surprise raids are being conducted in retail medical shops for detected OTC sale of anti-biotics.
  - Pharmacies must keep an accurate records of anti-biotic sales as per this initiative.
  - A poster mentioning 'anti-biotics not sold without doctor's prescription' should be displayed.
  - **Public can also participate in this initiative by reporting** any pharmacies selling anti-biotics without a prescription to the Drugs Department.
- **Note**: Kerala government, in 2018 became the first state to come up with the state action plan on AMR – **Kerala Anti-Microbial Resistance Strategic Action Plan** (KARSAP)

2) SWATCH BHARAT MISSION (SBM)

- Aligning with the ideals of Mahatma Gandhi, the Swachh Bharat Mission (SBM) was initiated in 2014 to achieve universal sanitation coverage by 2 October 2019.
- It was launched with a **multi-pronged approach** where focus was not only on construction of toilets but also on behavioural change in the communities.
- The mission has **two components** SBM-Gramin (MoDW&S (now Ministry of Jal Shakti)) and SBM-Urban (Ministry of Urban Development (now MoH&UA)) as the requirement of rural and urban areas were different.

  - **The objective of Swatch Bharat Mission (SBM-Gramin)** is to improve the general quality of life in rural areas, accelerate sanitation coverage, adopt sustainable sanitation practices and facilities, encourage use of cost effective and appropriate technologies and development of community managed sanitation systems focusing on solid and liquid waste management for overall cleanliness in rural areas.
  - The **Swatch Bharat Mission-Urban** (SBM-Urban) aimed to eliminate open defecation, eradicate manual scavenging, promote modern and scientific Municipal Solid Waste Management, Effect Behaviour change regarding sanitation practices, generate awareness, augment capacity for ULBs and to create enabling environment for private sector participation in Capital Expenditure, Operation and Maintenance.

3) SWATCH BHARAT MISSION (GRAMIN) (UNDER MINISTRY OF JAL SHAKTI)

- Swachh Bharat Mission (Grameen) (SBM(G)) was launched on 2nd Oct 2014 to ensure cleanliness in India and make Indian Open Defecation Free (ODF).
- Having **achieved the ODF status in all villages in the country** as of 2nd Oct 2019, **phase-II of SBM (G) is** now being implemented during FY21 and FY25, with the focus to sustain the ODF status of villages and covering all the villages with Solid and Liquid Waste management i.e. **to convert the villages from ODF to ODF Plus**.
- **Progress:**
  » More than 1.2 lakh villages have been declared ODF plus till 10th Nov 2022.
  » **Andaman & Nicobar Islands** has declared all its villages as ODF Plus, thus becoming the first *Swachh, Sujal Pradesh*.

4) SWATCHTA SURVEKSHAN, 2023

- Swatchta Survekshan was started in 2016 as a competitive monitoring framework of the progress of SBM in urban areas. It is an annual survey of cleanliness, hygiene, and sanitation in cities and towns across India as part of SBA-U.
  » It started with evaluation of 73 cities in 2016, but in 2023 it covered 4477 cities.

- It was launched by MoHUA with Quality Council of India its implementation partner:

- **The design** of Swachh Survekshan is based on **three key pillars:**
  » **Service Level Progress** - Evaluating progress of cities in ODF status, segregated waste collection, processing, disposal of solid waste and sustainable sanitation. Progress claim is validated through citizens and on-field visits.
  » **Citizens' Voice** - Assessment through direct feedback, engagement with citizens and innovations helmed by citizens.
  » **Certifications** - Assessing progress of cities in their performance under Ministry's certification protocols such as Star Rating for Garbage Free Cities and ODF/ODF+/ODF++/ Water+.

A) SWACHH SURVEKSHAN AWARDS 2023
- The President of India, Smt. Droupadi Murmu conferred Swachh Survekshan Awards 2023 at Bharat Mandapam, New Delhi, hosted by MoH&UA.
- 13 awardees received felicitations under categories of Clean Cities, Cleanest Cantonment, SafaiMitra Suraksha, Ganga Towns, and Best Performing States.
- **All India Clean City Rank-1** (Indore and Surat)
- Cleanest city with population less than 1 lakh **– Sasvad**, MHA
- **Cleanest cantonment board**: Mhow
- **Cleanest Ganga town:** Varanasi and Pryagraj
- **Best performing states:** Mha, MP, Chhattisgarh
- **Best Safaimitra Surakshit Sheher**: Chandigarh

5. SOCIAL JUSTICE: EDUCATION

1) ANNUAL STATUS OF EDUCATION REPORT, 2023 – 'BEYOND BASICS' (ASER, 2023 – BEYOND BASICS)

- Released in Jan 2024
- It is a nationwide citizen-led household survey that provides a snapshot of the status of Children's schooling and learning in rural India.
- **History:**
  - » ASER reports are being published since 2005.
  - » The **'basic' ASER survey** was conducted annually until 2014 and switched to alternate-year cycle in 2016.
    - ▫ It collects information about enrolment in preschool and school for children in the age group of 3-16 years.
    - ▫ It assesses children in the age group of 5 to 16 year one-on-one to understand their foundational reading and arithmetic abilities.
  - » In the **intervening year**, ASER **dives deeper into different aspects** of children's schooling and learning in rural India. The 2023 report is one such report.
- **Who releases the report:**
  - » ASER 2023 was released by ASER Centre, an organization focused on providing reliable data on the status of children's schooling and basic learning in India.
  - » **Note:**
    - ▫ **ASER Centre** is an independent research unit, which is responsible for conducting and releasing the ASER reports.
    - ▫ **PRATHAM** is an NGO focused on education. It played a key role in establishment of the ASER Centre and continues to collaborate with them. It's a crucial partner which contributes to data collection and dissemination efforts.

  - » **Key Highlights** of 2023 report.
    - ▫ The report puts the spotlight on youth aged 14 to 18 years in rural India.
    - ▫ **Overall**, 86.8% of 14-18 years old are enrolled in an educational institution.
      - » Small gender gap exists
      - » Notable difference on the basis of age - 3.9% of 14-year-old youth are not enrolled, when compared to 32.6% of 18 years old.
    - ▫ **Stream:**
      - » **Arts** & Humanities (55.7%).
      - » STEM (31.7%)
        - • **More Male** (36.3%) than Female (28.1%)
      - » Commerce (9.4%)
    - ▫ **Vocational Training** -> Only 5.6% of the surveyed youth
    - ▫ **Learning outcome**: The youth were surveyed on four points: Basic Reading, Math and English Abilities; Application of Basic Skills to everyday calculations; Reading and understanding written instructions; and financial calculations that need to be done in real life.
      - » **Basic Reading; Maths and English Abilities**:
        - • About 25% **cannot read a std II level text** fluently in their regional language.
          - • Females (76%) do better than males (70.9%).

- 56.7% struggle with <u>division (3 digit by 1 digit) problems</u>.
- More than 40% couldn't <u>read sentences in English</u>.
  - » **Application of Basic Skills to everyday calculations**:
    - 15% of the youth are <u>not able to measure length</u> using scale when the starting point is 0 cm.
    - 61% of the youth are <u>not able to measure length using scale</u> if the starting point was <u>not 0 cm</u>.

2) ALL INDIA SURVEY ON HIGHER EDUCATION (AISHE)

- **Why in news?**
  - » **Ministry of Education** releases All India Survey on Higher Education 2021-22 (Jan 2024)
- **In Jan 2024**, Ministry of Education, GoI, has released <u>All India Survey on Higher Education</u> (AISHE) 2021-22 covering <u>all HEIs in the country registered with AISHE</u> collecting detailed information on different parameters such as <u>student enrollment, teachers</u>, infrastructure information etc.
- **Key Highlights**:
  - » **Student enrolment** (4.33 crores) is <u>26% higher than 2014-15</u>.
  - » **Female Enrolment** (2.07 crores) has <u>increased by 32% compared to 2014-15</u>.
  - » There has been <u>substantial increase</u> in the enrolment of SC students, SC female students, ST students, ST female students etc.
  - » **Caste wise breakdown**: SC (15.3%); ST (6.3%); OBC (37.8%); Other communities (40.6%).
  - » **Gross Enrolment Ratio (GER)** has increased <u>to **28.4%** in 2021-22</u> when compared to 23.7% in 2014-15 (for population between 18-23 years of age).
    - ▫ **GER** caste wise (SC - 25.9%; ST - 21.2%;
  - » **Gender Parity Index** - the ratio of female GER to Male GER is **1.01** in 2021-22. (Note: GER has continued to remain <u>over 1 since 2017-18</u>). Thus <u>female GER continues to be higher than male GER for fifth consecutive year</u>.
  - » **Distribution of enrolment**:
    - ▫ **Government University** (73.7% enrolment) and <u>Private Universities</u> (26.3%) of total enrolment
    - ▫ **Graduation** (78.9%), **Post Graduation** (12.1%),
    - ▫ **PhD enrolment** in 2021-22 (2.12 lakh) has increased by <u>81.2%</u>;
    - ▫ **Discipline at undergraduate levels**: Arts (34.2%); Science (14.8%); Commerce (13.3%) and Engineering Technology (11.8%)

3) SCHEMES UNDER MINISTRY OF EDUCATION

B) PRADHAN MANTRI SCHOOLS FOR RISING INDIA (PM-SHRI SCHEME)
- It is a <u>Centrally Sponsored Scheme (CSS) launched on 7 September 2022</u>.
- The **objective** of the scheme is to **set up more than 14,500 PM SHRI Schools** over a <u>period of FY23 to FY27</u> by <u>strengthening the existing schools from those managed by central government/ state governments/ Ut government and local bodies</u>.
  - » **Total project cost**: Rs 27,360 crores (central share of 18128 crores)
  - » These schools will **showcase the implementation of the NEP** and emerge as **exemplary schools** over a period, while offering <u>leadership to other schools in the neighbourhood</u>.

- » These schools will be <u>equipped with modern infrastructure</u> including labs, smart classrooms, libraries, sports equipment, art room etc. which is inclusive and accessible.
- » They shall also be **developed as green schools** with <u>water conservation, waste recycling, energy-efficient infrastructure and integration of organic lifestyle in curriculum.</u>
- » **Pedagogy** of the school will be more <u>experimental, holistic</u>, inquiry-driven, discovery oriented etc.
- » More than <u>20 lakh students are expected to be direct beneficiaries</u> of the scheme
- » **Quality evaluation** of these schools will be conducted at <u>regular intervals</u> to ensure <u>desired standards.</u>

C) VIDYANJALI PROGRAM (A SCHOOL VOLUNTEER INITIATIVE)
- With the aim of <u>strengthening schools and improving the quality of school education</u> through **community, Corporate Social Responsibility (CSR) and private sector involvement** across the country, the Government has initiated Vidyanjali (a school volunteer management program).

- The Vidyanjali portal (<u>https://vidyanjali.education.gov.in/en</u>) enables community and volunteers/organisations to interact and **connect directly with the Government and Government aided schools of their choice and share their knowledge and skills** and/or contribute in the form of <u>assets/material/equipme</u>nt to meet the requirement of the schools.

- As of **20 January 2023**, 3,95,177 schools have been onboarded and <u>1,14,674 volunteers have registered on the Vidyanjali portal.</u>

D) EDCIL VIDYANJALI SCHOLARSHIP PROGRAM
- **Launched in Feb 2024** by Ministry of Education
- **The EdCIL Vidyanjali Scholarship Program**, in alignment with the <u>National Education Policy, 2020</u> is a powerful force aimed at <u>revolutionizing opportunities for quality education and access to higher education institutions</u>.
    - i. It **provides <u>financial support to meritorious students</u>** from **Navodaya Vidyalayas** <u>who lack means</u>, thereby promoting educational equity and inclusion.
    - ii. It also <u>encourages **involvement of private sector through CSR**</u> initiative, thereby <u>making way of joining forces between the Government and corporates towards an educated India.</u>

- It thus represents a <u>whole of society approach</u> to empowerment.

E) PARAKH (PERFORMANCE ASSESSMENT, REVIEW, AND ANALYSIS OF KNOWLEDGE FOR HOLISTIC DEVELOPMENT)
- It was launched <u>as part of NEP, 2020</u>.
- It has been set up as an <u>organization under NCERT</u>.
- It is envisaged as a <u>standard setting body</u> to advise school boards regarding new assessment patterns. It will thus work on <u>bringing school boards</u> across the states and UTs on a common platform
- It will also be holding <u>periodic learning outcome tests</u> like the <u>National Achievement Survey</u>, and State Achievement Surveys.

- It will work on <u>three major assessment areas</u>:
    i. **Large Scale Assessment**
    ii. **School Based Assessment**
    iii. **Examination Reforms**
- **Objectives**:
    ▪ **Uniform norms and guidelines**
    ▪ **Enhanced Assessment patterns -** It will help schools boards to <u>shift their assessment patterns</u> towards meeting the skill requirements of 21st century.
    ▪ **Reduce disparity in Evaluation** - across the states and boards which currently follow different standards of evaluation.
    ▪ **Benchmark Assessment**

F) BAL VATIKA PROGRAM

- It is designed as a <u>preparatory class for children before Grade-1</u>. It focuses on developing <u>cognitive, affective, and psychomotor abilities</u> and also <u>early literacy and numeracy</u> for students in the <u>age groups of 3+, 4+, and 5+ years</u>.

- It was <u>launched in Oct 2022</u> as a <u>pilot project</u> in **49 Kendriya Vidyalayas**.

G) PRASHAST: SCREENING TOOL (MOBILE APPS) FOR SPECIFIC LEARNING DISABILITIES
- **Pre-Assessment Holistic Screening Tool (PRASHAST)**:
    » It is a <u>disability screen mobile app</u> developed by the <u>Central Institute of Educational Technology (CIET)</u>, a constituent of NCERT.
    » It covers <u>all 21 disabilities</u> recognized by <u>Persons with Disabilities Act</u>, 2016.
    » It is available in <u>23 languages</u>, including all 22 languages included in the <u>VIII schedule of Indian Constitution</u>.
    » The app will <u>generate school wise report</u>, for further sharing with authorities for initiating the certification process, as per the guidelines of Samagra Shiksha.
- **Why is it needed?**
    » **Early identification** of Children with disability
    » **Facilitation** of timely intervention and support
    » **Enhancement of inclusivity** in school
    » Promoting <u>Equitable education for all</u>.

H) PRADHAN MANTRI-UCHCHATAR SHIKSHA ABHIYAN (PM-USHA)

- **Background**:

    » **Rashtriya Uchchatar Shiksha Abhiyan (RUSA)** was a **centrally sponsored scheme to fund states/UTs institutions**, with the vision to attain <u>higher levels of access, equity, and excellence in the State Higher Education system with greater efficiency</u>, transparency, accountability, and responsiveness.

    » <u>The first phase</u> of the scheme ran from 2013-2018 and <u>the 2nd phase was launched in 2018</u>.

» **Now**, in the light <u>of NEP, 2020</u>**, RUSA Scheme has been launched as Pradhan Mantri Uchchatar Shiksha Abhiyan (PM-USHA)**.

- <u>**Details about PM-USHA**</u>:

  » <u>**Centrally sponsored scheme**</u>.

  » It <u>covers government, and government aided institutions from the States and Uts</u>.

  » **Objective**: To enhance the quality of state higher education institutions by ensuring they meet established standards and using accreditation for quality assurance.

  » **It focuses on the following**:

    1. **Equity, Access and Inclusion**

    2. **Developing Quality Teaching & Learning Processes**:

       ▫ PM-USHA would provide <u>facilities to the institutions for upgrading the physical and digital infrastructure and also for the conversion of single-stream HEIs</u> into multiple stream institutions.

       ▫ <u>Faculty training</u> will be supported specially with the help of <u>Digital infrastructure</u>.

    3. **Accreditation of Non-Accredited Institutions & Improving Accreditation**:

       ▫ Currently, there are <u>limited number of HEIs with NAAC accreditation</u>. These institutions will **get handholding under the scheme** for getting accreditation as well as <u>enhancing accreditation from NAAC.</u>

    4. <u>**ICT based digital infrastructure**</u>:

       ▪ HEIs should be encouraged to <u>design, develop and **roll out MOOCs** for learners & teachers</u> as well as institutions and faculties.

       ▪ Under PM-USHA, institutions would be encouraged to provide <u>Wi-Fi facilities</u>, smart classes, and virtual labs on the institute campus.

    5. **Enhancing Employability through Multidisciplinary**:

       ▪ PM-USHA will <u>encourage HEIs to get linked with the industry and market to strengthen skills, innovations and employability</u>.

- **Other Key focus**:

  » Rs. 100 crore support to each of 35 state universities for Multidisciplinary Education and Research University (MERU) Transformation.

  » Establishment of Model Degree Colleges.

  » Grants for strengthening universities.

  » Focus on remote, LWE affected, Aspirational and low Gross Enrolment Ratio regions.

I) SATHEEE (SELF ASSESSMENT, TEST, AND HELP FOR ENTRANCE EXAMINATION) PORTAL

- **Ministry of Education**
- The Department of Higher Education, **Ministry of Education in collaboration with IIT Kanpur** has <u>started **SATHEE** (Self-Assessment, Test and Help for Entrance Examination) portal</u> to **provide quality education to every student who intend to participate in competitive Education** such as JEE, NEET, and various State level engineering and other examination.
  - ▫ Ministry of Education has <u>written to all States/Uts to inform educators and students about this facility</u> which can be <u>used for competitive examinations</u> preparation and for <u>knowledge enhancement</u>.
- SATHEE Mitras to increase rural coverage of students appearing for entrance tests, including the JEE and NEET.

- It uses an indigenously-developed **AI programme** called **Prutor**, which was developed through IIT-Kanpur.

- Learning material is available in Hindi, English and many regional languages

J) PRERNA PROGRAM

- **Ministry:** Department of School Education & Literacy, Ministry of Education has launched '**Prerana**: An Experimental Learning Program'. **Prerna** is driven by a <u>strong commitment</u> to **integrate principles of Indian education system** and the **philosophy of value-based education** which is a corner stone of the <u>NEP, 2020</u>.
- It is a <u>week-long</u> **residential program** for selected students of <u>class IX to XII</u>.
- It is an <u>experiential and inspirational learning program</u> for students with the <u>best-in-class technology</u> where <u>heritage meets innovation</u>.
- A batch of **20 selected students** (10 boys and 10 girls) will attend the program, every week from various parts of the country.
- **Where?**
  - ▫ It will run from a <u>vernacular school established in 1888, Vadnagar, Mehasana, Gujarat</u>.
- **The curriculum** of Prerna School prepared by IIT Gandhinagar is <u>rooted in nine value-based **themes**</u>.
- It will feature, Yoga, mindfulness, and meditation. It will help students answer questions like "who am I?", "What is our history and culture", "What can I do for the country" etc.