You & Technology Feb-2022

ASPIRE IAS
The Name Associated with Excellence

GOOD MORNING TIMES S&T

(FEBRUARY-2022)

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General Studies Paper-3 – S&T – Feb 2022

ADDITIVE MANUFACTURING

- National Strategy on Additive Manufacturing was released by the Ministry of Electronics & Information Technology

Additive Manufacturing process

- It begins with a software programme used to design a digital model for prototyping a physical object, a process referred to as CAD.
- Digital model is then converted to a Stereolithography file (.STL). STL breaks it down into a series of polygons, which represent surfaces of an object, and the model is then fed to Computer Aided Manufacturing software (CAM)

- AM is a process in which a three-dimensional object is built from a computer-aided design (CAD) model, usually by successively adding materials in a layer-by-layer fashion.
- The addition of material can happen in multiple ways, namely power deposition, resin curing, filament fusing.
- The deposition and solidification are controlled by computer to create a three-dimensional object.
- Thermoplastics, Metals, Ceramics as well as Biomaterials can be used in AM
- AM market globally focused on the sectors including automotive, consumer products, medical, business machines, aerospace, government/military, academic and others.
- Unlike AM, traditional manufacturing methods, by contrast, are subtractive in nature. o Subtractive manufacturing involves removing parts of a block of material in order to create the desired shape.

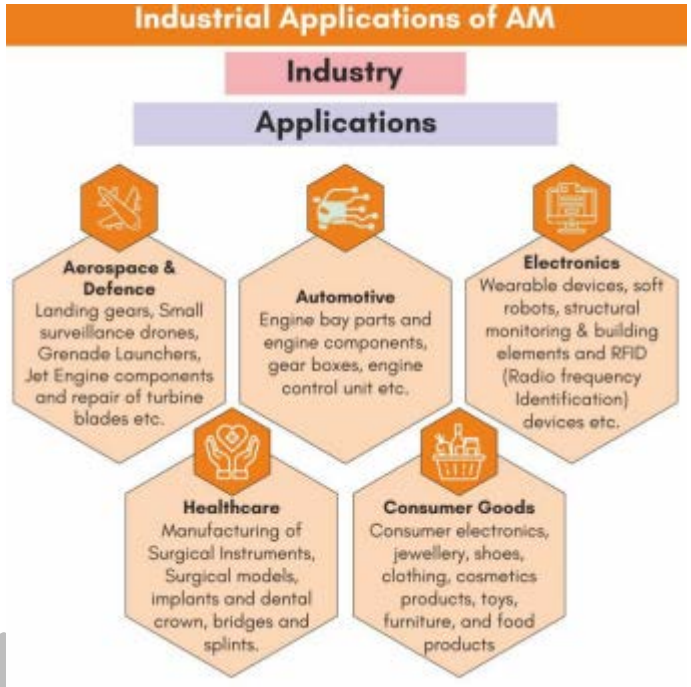
Impact of Additive Manufacturing

- AM facilitates development of new materials and technologies which are more energy and resource efficient to alleviate its carbon footprint and increases its energy security

- AM has the potential to fabricate biomedical implants, prosthetics, skin/tissues and intricate organs, specialized surgical instruments and medicals devices quickly and cost effectively.

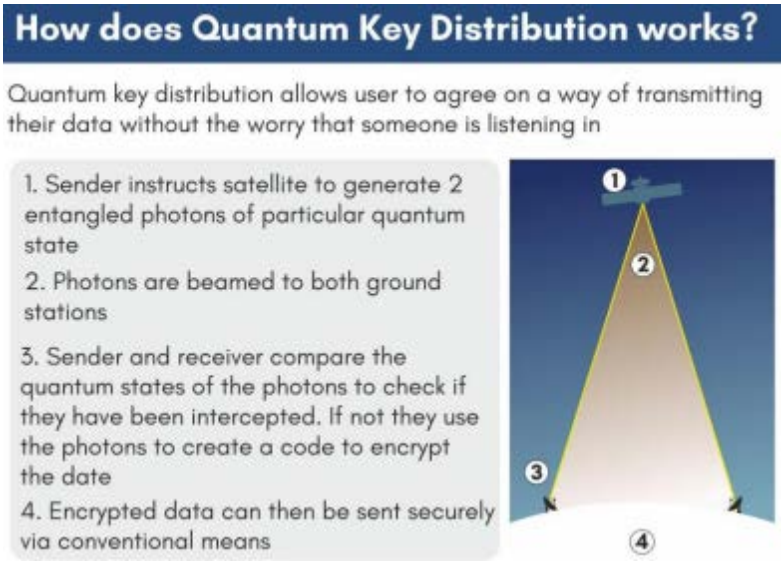
Initiatives taken in India

- Under Atal Innovation Mission, Atal Tinkering Labs have been set up, where do-it-yourself (DIY) kits on latest technologies like 3D Printers, Robotics, Miniaturized electronics are installed through government financial support.
- Department of Heavy Industries collaborated with Wipro to build India's first industrial grade 3D printer
- Establishment of 3D printing Manufacturing Lab at National Institute of Electronics & Information Technology, Aurangabad.



QUANTUM KEY DISTRIBUTION

- It is a secure communication technology that uses quantum physics to construct a cryptographic protocol.
- It allows two parties to generate a shared secret key that is only known to them and can be used to encrypt and decrypt messages, thus achieving a very highly secure communication.
- In traditional cryptography, the security is usually based on the fact that an adversary is unable to solve a certain mathematical problem while in QKD, security is achieved through the laws of quantum physics.
- Two such most important laws in quantum physics are Superposition and Entanglement.
- Superposition means that each quantum bit (basic unit of information in a quantum computer) can represent both a 1 and a 0 at the same time.
- In quantum entanglement, subatomic particles become "entangled" (linked) in such a way that any change in one disturbs the other even if both are at opposite ends of the universe.



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About Quantum Technology

- Quantum technology seeks to harness laws of quantum physics, which describe the behaviour of matter and energy at the atomic and subatomic level
- This is unlike classical physics, in which an object can exist in one place at one time. E.g. classical computers operate using binary physical state, meaning its operations are based on one of two positions (1 or 0).
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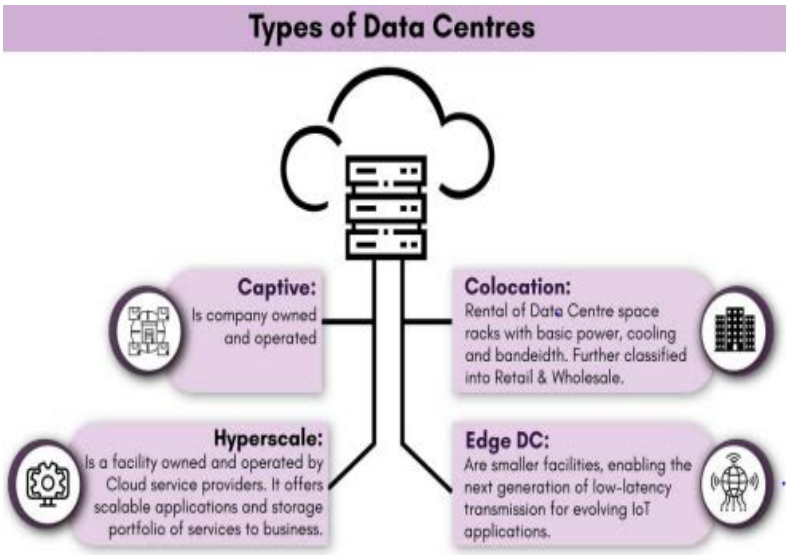
initiatives taken for advancement of Quantum Technology

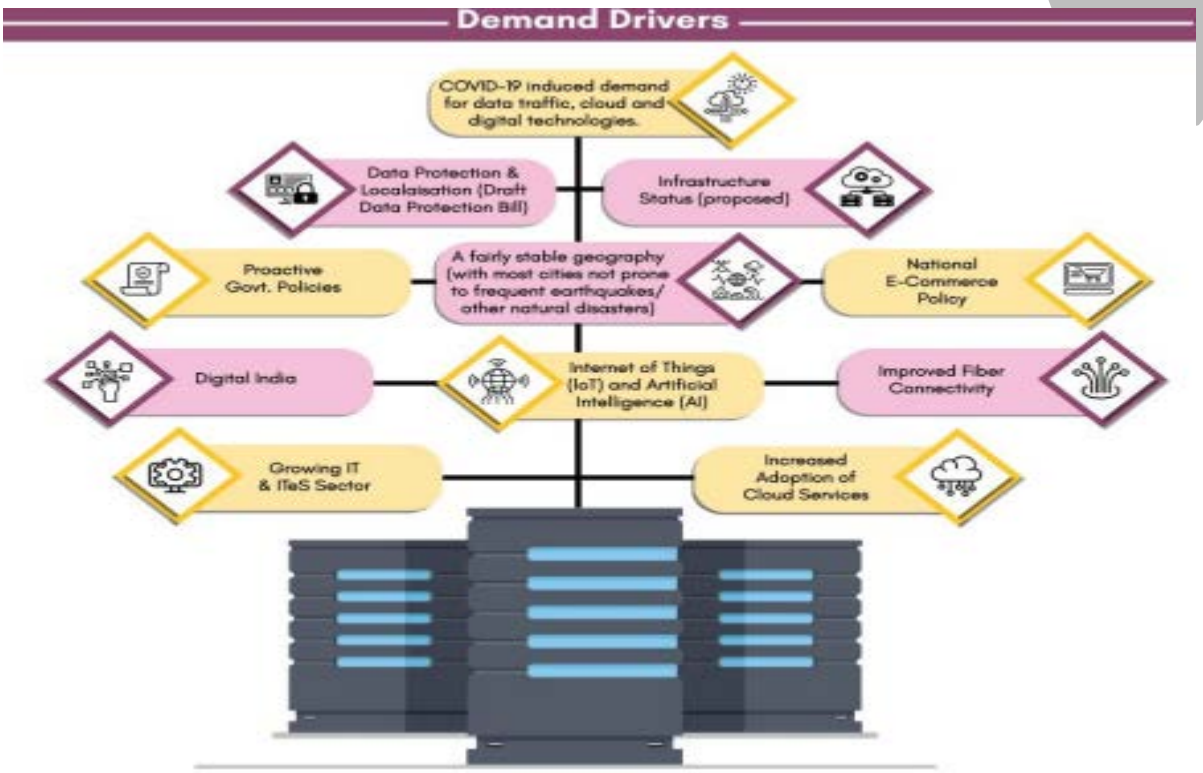
- National Mission on Quantum Technologies and Applications (NM-QTA): Budget 2020 allocated Rs 8000 Crore to the mission for a period of five years.
- Quantum-Enabled Science & Technology (QuEST): It is a research program to build quantum capabilities set up by the Department of Science & Technology.
- Quantum Frontier mission: It is an initiative of the Prime Minister's Science, Technology, and Innovation Advisory Council (PMSTIAC) which aims to initiate work in the understanding and control of quantum mechanical systems
- DRDO Young Scientist Laboratory for Quantum Technologies (DYSL-QT), Mumbai, developed a Quantum Random Number Generation (QRNG), which has the ability to detect random quantum events and convert those into a stream of binary digits.
- Indian Army, with support from the National Security Council Secretariat (NSCS) established the Quantum Lab at Military College of Telecommunication Engineering, Mhow.

DATA CENTRES

- Data centre is a dedicated secure space within a building / centralized location where computing and networking equipment is concentrated for the purpose of collecting, storing, processing, distributing or allowing access to large amounts of data.
- Key components of a data center design include routers, switches, firewalls, storage systems, servers, and application-delivery controllers. Together these components provide:



- Network infrastructure: This connects servers (physical and virtualized), data center services, storage, and external connectivity to end-user locations
- Storage infrastructure: Data is the fuel of the modern data center. Storage systems are used to hold this valuable commodity
- Computing resources: Applications are the engines of a data center. These servers provide the processing, memory, local storage, and network connectivity that drive applications.



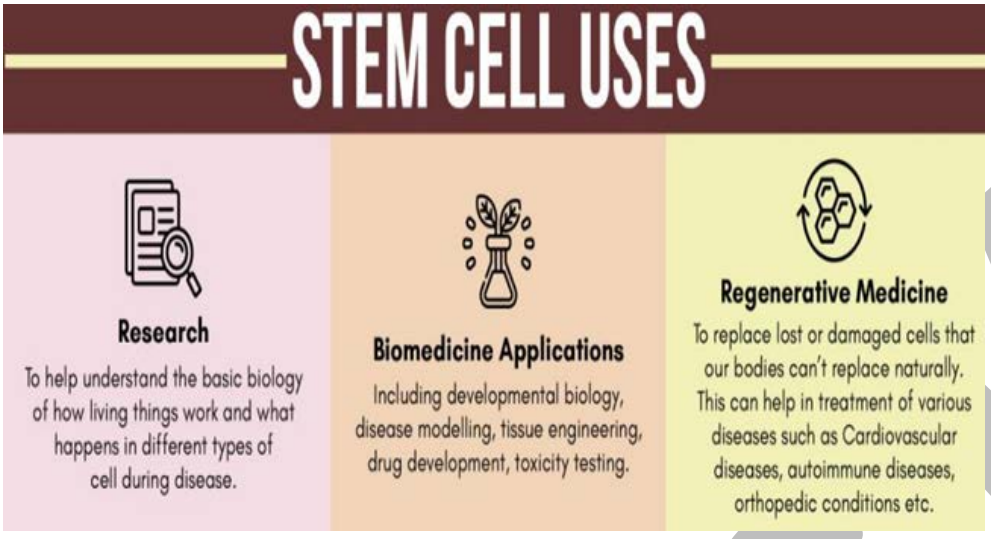
Initiatives taken in India

- Draft Data Centre policy by Meity to accelerate the growth in the projected Data Centre capacity in the country.
- Uttar Pradesh's data center policy provides several incentives such as land subsidy, capital subsidy, stamp duty exemption etc
- In February 2020, Finance Minister in her budget speech announced the intention of the Government of India to develop a Data Centre policy.
- National Informatics Centre (NIC) has set up state-ofthe-art National Data Centres at NIC Headquarters Delhi, Pune, Hyderabad and Bhubaneswar and 37 small Data Centres at various State Capitals to provide services to the Government at all levels.

STEM CELLS

- Stem cells are special human cells that are able to develop into many different cell types. Stem cells provide new cells for the body as it grows and replaces specialized cells that are damaged or lost.

- They can divide over and over again to produce new cells. As they divide, they can change into the other types of cells that make up the body
- Based on the cell type/tissue of origin, stem cells are classified as 'Somatic Stem Cells' (SSCs), and 'Embryonic Stem Cells' (ESCs)



About Stem Cell Therapy (SCT)

- SCT, also known as regenerative medicine and bone marrow transplant, promotes the repair response of diseased, dysfunctional or injured tissue using stem cells or their derivatives.
- Researchers grow stem cells in a lab. These stem cells are manipulated to specialize into specific types of cells, such as heart muscle cells, blood cells or nerve cells.
- The specialized cells can then be implanted into a person

Two of the most common types of stem cell transplants are autologous and allogeneic transplants.

- **Autologous transplantation** uses the patient's **own stem cells**. These cells are **removed, treated and returned** to his or her own body after a conditioning regimen.
- **Allogeneic transplantation where** stem cells come from another person, called a donor.

- Stem cells and their derivatives fall under definition of 'Drug' as per the Drugs and Cosmetics Act 1940 and are categorized as 'Investigational New Drug (IND)' or 'Investigational New Entity (INE)' when used for clinical application.
- National Guidelines for Stem Cell Research- 2017- As per these guidelines, only bone marrow/hematopoietic SCT for blood disorders (including blood cancers and thalassemia) is permitted and use of stem cells all other conditions has to be done only under purview of clinical trials in compliance with National Guidelines for Stem Cell Research 2017.

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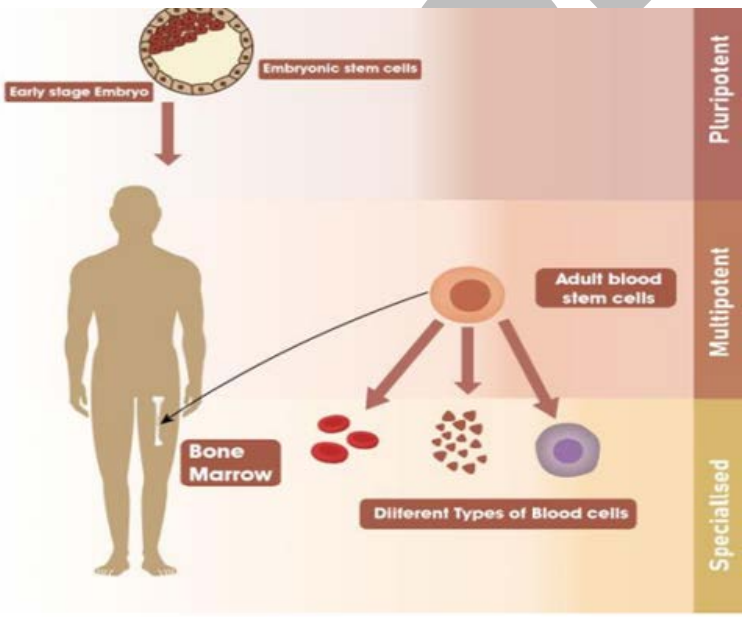
Somatic Stem Cells (SSCs) also Known as Adult Stem Cell

- Limited capacity of differentiation and **may be multipotent or unipotent.**
- Are resident, **self-renewable population of cells** that are present virtually in all organs/tissues of the body.
- **Could be obtained from different sources,** for example the fetus, umbilical cord, placenta, infant, child or adult; and from different organs/tissues.
- **Generally present in relatively low numbers** in most tissues.

Embryonic Stem Cells (ESCs)

- ESCs are **pluripotent stem cells,** which mean they can change into any cell in the body.
- ESCs **supply new cells for an embryo as it grows** and develops into a baby.
- Pluripotent stem cells **can also be generated in the laboratory** (by taking normal adult cells, like skin or blood cells, and reprogramming them) and the products thus generated are referred to as **'Induced Pluripotent Stem Cells (iPSCs)'.**
- ESCs and iPSCs **have tumorigenic potential which could be a major safety concern** during clinical application of these cells.



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NUCLEAR FUSION

- A team at the Joint European Torus (JET) facility near Oxford in central England generated 59 megajoules of sustained fusion energy over five seconds (11 megawatts of power), more than doubling a 1997 record.
- The energy was produced in a machine called a tokamak, a doughnut-shaped apparatus, and the JET site is the largest operational one of its kind in the world.

Tokamak

- The **tokamak** is an experimental **magnetic fusion device** designed to harness the energy of fusion.
- Inside a tokamak, the energy produced through the fusion is **absorbed as heat in the walls of the vessel**, which will be used by a fusion power plant to produce steam and then electricity by way of turbines and generators.
- The device uses **magnetic fields** to contain and control the hot plasma, which enables the fusion between **deuterium and tritium nuclei** to produce great amounts of energy.

Read here in detail- Nuclear Fusion Energy - AspireIAS

Advantage of Nuclear Fusion:

- Much more energy (as much as four times) is released in the fusion process than in fission. Also, a kg of fusion fuel contains about several million times as much energy as a kg of coal, oil or gas.
- Fusion doesn't emit harmful toxins like carbon dioxide or other greenhouse gases into the atmosphere. Its major by-product is helium: an inert, non-toxic gas.
- It is difficult to reach and maintain the precise conditions necessary for fusion. Thus if any disturbance occurs, the plasma cools within seconds and the reaction stops.
- Fusion doesn't employ fissile materials like uranium and plutonium (Radioactive tritium is neither a fissile nor a fissionable material). There are no enriched materials in a fusion reactor that could be exploited to make nuclear weapons.
- Fusion fuels are widely available and nearly inexhaustible. Raw materials are in sufficient supply and produces much less radioactive waste compared to fission.

Chandrayaan-3 Mission

- The Chandrayaan-3 mission is a follow-up of Chandrayaan-2 of July 2019, which aimed to land a rover on the lunar South Pole
- It will have an orbiter and a landing module. However, this orbiter won't be loaded with scientific instruments like the Chandrayaan-2
- Its job will only be confined to carry the lander to the moon, oversee the landing from its orbit and communicate between the lander and the earth station.

Chandrayaan-2 Mission

- Chandrayaan-2 consisted of an Orbiter, Lander and Rover, all equipped with scientific instruments to study the moon.

- ISRO had named the Lander module as Vikram, after Vikram Sarabhai, the pioneer of India's space programme, and the Rover module as Pragyaan, meaning wisdom
- It was sent aboard the country's most powerful geosynchronous launch vehicle, the GSLV-Mk 3.

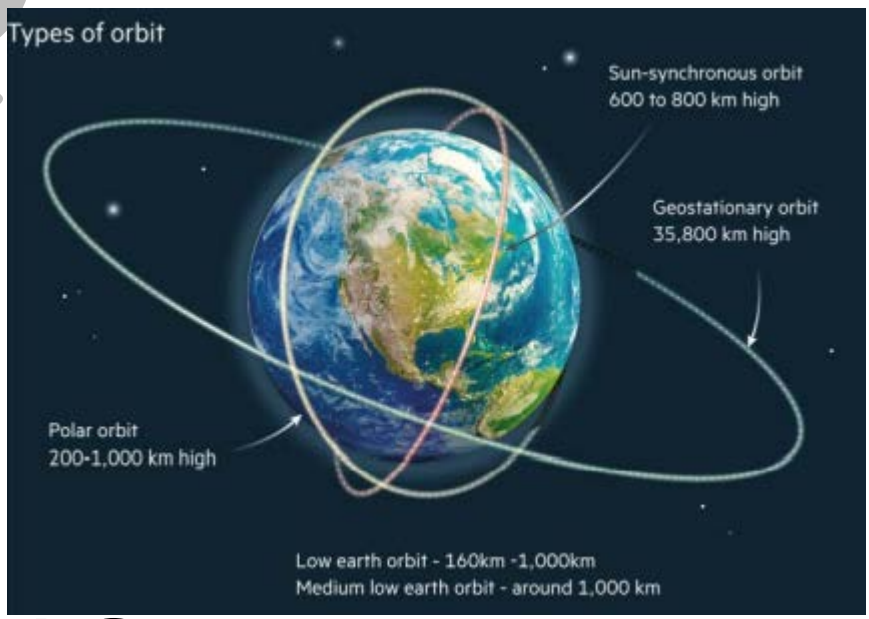
Different Types of Orbits

Polar Orbit

- A polar orbit travels north-south over the poles and takes approximately 90 minutes for a full rotation.
- These orbits have an inclination near 90 degrees. This allows the satellite to see virtually every part of the Earth as the Earth rotates underneath it.
- These satellites have many uses such as monitoring crops, global security, measuring ozone concentrations in the stratosphere or measuring temperatures in the atmosphere.
- Almost all the satellites that are in a polar orbit are at lower altitudes.
- An orbit is called sun-synchronous when the angle between the line joining the centre of the Earth and the satellite and the Sun is constant throughout the orbit
- These orbits are also referred to as "Low Earth Orbit (LEO)" which enables the onboard camera to take images of the earth under the same sunillumination conditions during each of the repeated visits, thus making the satellite useful for earth resources monitoring.
- It passes over any given point on Earth's surface at the same local solar time.

Geosynchronous Orbit

- Geosynchronous satellites are launched into orbit in the same direction the Earth is spinning and can have any inclination
- When the satellite is in orbit at a specific altitude (approximately 36,000km above the Earth's surface), it will exactly match the rotation of the Earth.
- While, Geostationary orbits fall in the same category as geosynchronous orbits, but with that one special quality of being parked over the equator. In the case of geostationary satellites, the Earth's force of gravity is exactly enough to provide acceleration required for circular motion.



Geosynchronous Transfer Orbit(GTO):

- To attain geostationary or geosynchronous earth orbits, a spacecraft is first launched into a Geosynchronous Transfer Orbit.
- From the GTO the spacecraft uses its engines to shift to geostationary or geosynchronous orbit.

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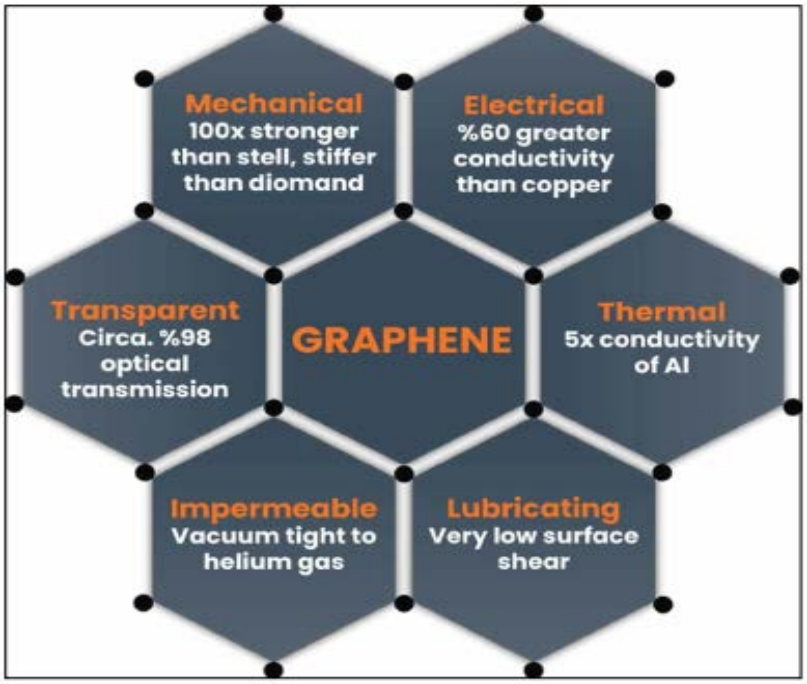
India's First Graphene Innovation Centre in Kerala

- Kerala government announced that the country's first Graphene Innovation Centre would come up in Thrissur, Kerala
- Graphene is a one-atom-thick layer of carbon atoms arranged in a hexagonal lattice. It is the building-block of Graphite
- It is the thinnest, most electrically and thermally conductive material in the world, while also being flexible, transparent and incredibly strong.



- graphene could replace Indium and thereby bring down the cost of OLED
- Graphene has a lot of promise for additional applications: anti-corrosion coatings and paints, efficient and precise sensors, faster and efficient electronics, flexible displays, efficient solar panels, faster DNA sequencing, drug delivery, and more.

Geomagnetic Storm

- Solar Storms occur during the release of magnetic energy associated with sunspots ('dark' regions on the Sun that are cooler than the surrounding photosphere - the lowest layer of the solar atmosphere), and can last for a few minutes or hours.
- A geomagnetic storm is a major disturbance of Earth's magnetosphere that occurs when there is a very efficient exchange of energy from the solar wind into the space environment surrounding Earth.
- The magnetosphere shields our home planet from harmful solar and cosmic particle radiation, as well as erosion of the atmosphere by the solar wind – the constant flow of charged particles streaming off the Sun.
- These storms result from variations in the solar wind that produce major changes in the currents, plasmas, and fields in Earth's magnetosphere.

- The largest storms that result from these conditions are associated with solar Coronal Mass Ejections (CMEs) where a billion tons or so of plasma from the sun, with its embedded magnetic field, arrives at Earth.

How does it Affect Earth?

- Not all solar flares reach Earth, but solar flares/ storms, Solar Energetic Particles (SEPs), highspeed solar winds, and Coronal Mass Ejections (CMEs) that come close can impact space weather in near-Earth space and the upper atmosphere.
- Solar storms can hit operations of space-dependent services like Global Positioning Systems (GPS), radio, and satellite communications. Aircraft flights, power grids, and space exploration programmes are vulnerable.
- Coronal Mass Ejections (CMEs) with ejectiles loaded with matter travelling at millions of miles an hour, can potentially create disturbances in the magnetosphere, the protective shield surrounding the Earth.

ARTIFICIAL SNOW

- For the first time in the history of the Winter Olympics, athletes will compete on 100% artificial snow in Beijing.
- Artificial snow is small particles of ice that are used to increase the amount of snow available for winter sports such as skiing or snowboarding.
- It is produced by a machine that uses a highpressure pump to spray a mist of water into the cold air. The water droplets subsequently crystallize to form fake snow.

FSSAI HEALTH STAR RATING

- Food Safety and Standards Authority of India (FSSAI) is starting a star rating system for packaged foods.
- Rating system will be similar to star energy rating by Bureau of Energy Efficiency for an electronic appliance.
- Packaged foods will display the number of stars on the front of the pack, indicating how healthy or unhealthy it is depending upon the amount of salt, sugar and fat it has

SERVICES E-HEALTH ASSISTANCE AND TELECONSULTATION (SEHAT)

- Ministry of Defence has rolled out the home delivery of medicines for veterans and serving military personnel in Delhi, seeking healthcare services under an online medical consultation platform.
- SeHAT stay-home OPD is a patient-to-doctor system where the patient can consult a doctor remotely through the internet using his Smartphone, laptop, Desktop or Tablet.

HAVANA SYNDROME

- A new report on Havana syndrome (a mysterious illness that afflicted hundreds of United States diplomats and intelligence officials worldwide) has brought renewed attention to microwave weapons.
- It refers to a set of mental health symptoms that typically involves hearing certain sounds without any outside noise being present, nausea, vertigo and headaches, memory loss and issues with balance.
- It was first reported by officials based in the U.S. embassy in Cuba in 2016.

CASES OF FAIRBANK'S DISEASE AND ACROMEGALY IN INDIA

- Both these are rare disorders, affecting fewer than 1 in 2500 individuals.
- Acromegaly is caused by excessive secretion of growth hormone, from a tumour in the pituitary gland.
- It causes increased height when it manifests in childhood and adolescent age group.
- Fairbank's disease is also known as Multiple epiphyseal dysplasia.
- In this patient usually requires management of pain and orthopedic procedures.

LASSA FEVER

- Lassa fever is zoonotic disease caused by Lassa virus.
- It is endemic in parts of West Africa including Sierra Leone, Liberia, Guinea and Nigeria
- It spreads through Infected rats, rarely spread via direct contact with a sick person’s body fluids
- Ribavirin an antiviral drug that is used for its treatment and maintaining hydration, oxygen levels etc.

POLIOMYELITIS (POLIO)

- Malawi has recorded Africa’s first wild poliovirus (WPV) case in five years.
- Poliomyelitis (polio) is a highly infectious viral disease that largely affects children under 5 years of age.
- It may affect the spinal cord causing muscle weakness and paralysis. o Transmitted by person-to-person spread mainly through the faecal-oral route or, less frequently, by a contaminated water or food).
- Wild poliovirus (WPV) is the most commonly known form of the poliovirus.

CONVERSION THERAPY

- National medical commission held that conversion therapy is banned in India.
- Conversion therapy - sometimes called "reparative therapy" or "gay cure therapy" - tries to change someone's sexual orientation or gender identity.
- Several countries (Brazil, Ecuador, Malta, Switzerland, Germany, Chile etc.) have introduced criminal bans for those found to be practicing conversion therapy.

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BONE OSSIFICATION TEST

- It is an age determination test of a person on the basis of assessment of his or her bony framework done through X-Rays/ CT-scans.
- The test is required to determine the age in order to fix the criminal liabilities based on which the law treats the persons differently based on their age.
- Recently, Supreme Court has said the test can't be said to be an infallible and cannot be the sole basis to decide the age of an accused who claims to be a juvenile.

PARKER SOLAR PROBE (PSP)

- Launched by NASA in 2018.
- Using data from PSP, scientists were able to peer beneath Venus' thick atmosphere to take the first visible light images of the surface.
- Venus's sky is filled with thick, toxic clouds that rain sulfuric acid making it difficult to investigate up close
- Launched from Cape Canaveral (Florida), PSP Mission is first spacecraft which has flown through the Sun's upper atmosphere (Corona) to study the Sun.

2 SMALL SATELLITES LAUNCHED BY ISRO

- InspireSat-1 satellite to study ionosphere dynamics and the Sun's coronal heating process. ✓ Satellite is built by Indian Institute of Space Science and Technology& other institutes. ✓ Life of the mission is one year
- INS-2DT has a thermal imaging camera and can help in assessment of land and water surface temperatures and in mapping vegetation and thermal inertia (day and night). ✓ This is a technology demonstrator satellite from ISRO, a precursor to the India-Bhutan Joint Satellite (INS-2B).

EOS (EARTH OBSERVATION SATELLITE) -04

- Launched aboard a Polar Satellite Launch Vehicle, EOS04 is a radar imaging satellite capable of providing high-quality images under all weather conditions.
- EOS-04 is the fourth in a series of earth observation satellites and can be used to capture images for agriculture, forestry, flood mapping, soil moisture and hydrology.

PLUTO'S ATMOSPHERIC PRESSURE

- A team of scientists have derived accurate value of Pluto's atmospheric pressure which is 80,000 times less than the atmospheric pressure at mean sea level on Earth
- It was calculated from data obtained by observation of stellar occultation by Pluto.
- An occultation happens when a celestial object gets hidden from the view of the observer due to another celestial object passing in between them

- Data was calculated using 3.6-m Devasthal optical telescope (DOT) (India's largest optical telescope) in Nainital

PARAM PRAVEGA SUPERCOMPUTER

- It was installed and commissioned by Indian Institute of Science (IISc.) under National Supercomputing Mission (NSM).
- NSM was launched to enhance the research capacities and capabilities in the country by connecting them to form a Supercomputing grid, with National Knowledge Network as backbone.
- Mission is being jointly steered by Department of Science and Technology and Ministry of Electronics and Information Technology and implemented by Centre for Development of Advanced Computing, and IISc

ACCELERATE VIGYAN

- Launched in 2020, by Science and Engineering Research Board (SERB) to strengthen scientific research mechanisms in the country
- consolidation of all scientific programs is its goal

Its component include:

- ABHYAAS Programme for boosting R&D by enabling potential PG/PhD students through HighEnd Workshops i.e. KARYASHALA and Research Internships i.e. VRITIKA.
- SAMOOHAN programme for capacity building activities in S&T.

SERB was setup by an Act of Parliament, for promoting basic research in Science and Engineering and to provide financial assistance to persons engaged in such research, etc.

SYNTHETIC BIOLOGY

- Synthetic biology refers to design, re-design and fabrication of biological components and systems that do not already exist in the natural world.
- Potential applications are biofuels, bioremediation, biosensors, health (biosensor-based diagnostics, engineered bacteria to target specific pathogens etc.), Food fortifications etc

Concerns regarding using synthetic biology:

- Biosafety: Can cause problems like allergies, antibiotic resistance, carcinogens, and toxicity among humans.
- Biosecurity: Related to inappropriate, or malicious use of potentially dangerous biological agents or biotechnology to develop biological weapons

Parliament is yet to clear Biotechnology Regulatory Authority of India Bill, 2013, that had provisions for regulating research around genetic engineering that could have also encompassed synthetic biology.

TAMIL NADU SAYS NO TO INDIAN NEUTRINO OBSERVATORY (INO) PROJECT IN THENI

- Tunnelling work would create the problems like construction waste material, rock bust, and roof collapse movement in the eco-fragile area.
- The area is a significant watershed and catchment zone for the rivers Sambhal and Kottakudi and supports livelihoods in five districts of Tamil Nadu
- The project area links Periyar Tiger Reserve in Kerala with Srivilliputhur Meghamalai Tiger Reserve.

About INO

- It is a multi-institutional effort aimed at building a world-class underground laboratoryand an Iron Calorimeter (ICAL) detector for studying neutrinos.
- It aims to assess the properties of neutrino particles and to make precision measurements of the parameters related to neutrino oscillations.
- It is jointly funded by the Dept. of Atomic Energy and the Dept. of Science and Technology.

About Neutrinos

- Neutrinos are **tiny, neutral, elementary particles** which interact with matter via the weak force. The weakness of this force gives neutrinos the property that **matter is almost transparent to them.**
- The Sun, and all other stars, produce neutrinos copiously due to nuclear fusion and decay processes within their core.
- Neutrinos provide a **tool to study the structure of nucleons** (protons and neutrinos), to **learn how matter evolved** from simple particles into more complex composites of particles.

GRIME EATING BACTERIA TO RESTORE CLASSICAL ART

- The researchers first used the bacteria Desulfovibrio Vulgaris to clean a marble monument at the Cave Hill Cemetery in Louisville, in the US
- Desulfovibrio Vulgaris is a Gram-negative, anaerobic, non-spore-forming, curved rod-shaped bacteria, that can be found in soil, animal intestines and faeces, and fresh and saltwater
- Pseudomonas stutzeri has been trusted to clean a range of monuments, as well as the stones of historic bridges and granite slabs of chapels in Spain

WEB3

- Web3 is an umbrella term for disparate ideas all pointing in the direction of eliminating the big middlemen on the internet
- The model, a decentralized internet to be run on block chain technology, would be different from the versions in use i.e. Web 1.0 and Web 2.0
- In web3, users will have ownership stakes in platforms and applications unlike now where tech giants control the platforms. In this new era, navigating the web no longer means logging onto the likes of Facebook, Google, or Twitter
- The Web3 movement has been helped along by the rise of NFTs, or non-fungible tokens, which are digital collectibles and other online files that can be bought and sold with cryptocurrency

XENOTRANSPLANTATION

- Xenotransplantation is any procedure that involves the transplantation, implantation or infusion into a human recipient of either live cells, tissues, or organs from a nonhuman animal source, or human body fluids, cells, tissues or organs that have had ex vivo contact with live nonhuman animal cells, tissues or organs.
- Pigs are increasingly becoming popular candidates for organ transplantation. This is because their organs are anatomically similar to those of humans

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ASPIRE IAS UPCOMING EXCLUSIVE sessions FOR MAINS-2022 (Online & Offline)

1. Geography OPTIONAL and RRVAP (Rapid round value addition programme with TEST SERIES)

- For the last 5 years favourite programme among students.
- Where you are lacking we are working upon like, Paper-2 in contemporary and geographical manner, Mapping and its application, special emphasis on Thoughts-Regional planning and biogeography.
- Full coverage of geography with writing skill development
- 2013 when the average score was 140 in Geo our students scored 200+ (Isha Dhuna, Nitin Agarwal and Aditya uppal)
- 2014 when average score is 230 our students scored 280-300 (Aditya uppal RANK-19 309 marks)
- Same trend in 2015-18
- Starts after 7 days of PT examination

2. Our best and SUCCESS GRADE course Newspaper analysis and writing skill programme.

** Our TM and most successful programme start 7 days of PT exam with the coverage of last **3 years issues** highly helpful in P-2&3 (Seats are limited). *FOR FRESHERS AS WELL AS THOSE WHO WANT TO SCORE 450+ IN MAINS 2019*

3. Writing skill development, enhancement and management programme.

- Best developed programme to enhance the writing skills at individual level
- Yield a fantastic result: RANK-22 (Saloni Rai) and Rank 1 Nandani others….

33 sessions with same day discussion, feedback and evaluation of the copies.

4. Special batch for ETHICS and 150 CASE STUDIES. (15 days with the guidance to score 110+ by DIRECTOR sir)

5. Geography for GS MAINS

6. Sociology, political science and Public administration full course and crash course with writing skills.

7. Ncert Foundation btach.

8. Target-50 GS-FOUNDATION batch for 2022….

All the Best to all my Economics students…
Hope this material will help you.
God bless...JAI Hind

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All the Best
Jai Hind ☺