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SCIENCE & TECHNOLOGY

OCTOBER 2019

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1. SPACE

1.1 Mars 2020 Rover Mission

Why in News?

NASA's rover is scheduled to launch by Aug, 2020.

What is Mars 2020 rover mission?

- The Mars 2020 rover mission is part of NASA's Mars Exploration Program, a long-term effort of robotic exploration of the Red Planet.
- The Mars 2020 mission addresses high-priority science goals for Mars exploration, including key questions about the potential for life on Mars.
- The mission takes the next step by not only seeking signs of habitable conditions on Mars in the ancient past, but also searching for signs of past microbial life itself.
- The Mars 2020 rover introduces a drill that can collect core samples of the most promising rocks and soils and set them aside in a "cache" on the surface of Mars.
- A future mission could potentially return these samples to Earth.
- The mission also provides opportunities to gather knowledge and demonstrate technologies that address the challenges of future human expeditions to Mars.
- The mission is timed for a launch opportunity in July 2020 when Earth and Mars are in good positions relative to each other for landing on Mars.
- It takes less power to travel to Mars at this time, compared to other times when Earth and Mars are in different positions in their orbits.
- To keep mission costs and risks as low as possible, the Mars 2020 design is based on NASA's successful Mars Science Laboratory mission architecture, including its Curiosity rover and proven landing system.

1.2 New galaxy found

Why in News?

Astronomers have found a massive galaxy, dating back to the early universe, lurking in cosmic dust clouds.

What is Cosmic dust?

- Cosmic dust is made of various elements, such as carbon, oxygen, iron and other atoms heavier than hydrogen and helium.
- It is the stuff of which planets and people are made, and it is essential for star formation.
- Stars like our sun churn out flecks of dust as they age, spawning new generations of stars and their orbiting planets.

What is the life cycle of a star?

NEBULA

- A nebula is a cloud of gas (hydrogen) and dust in space.
- Nebulae are the birthplaces of stars.

STAR

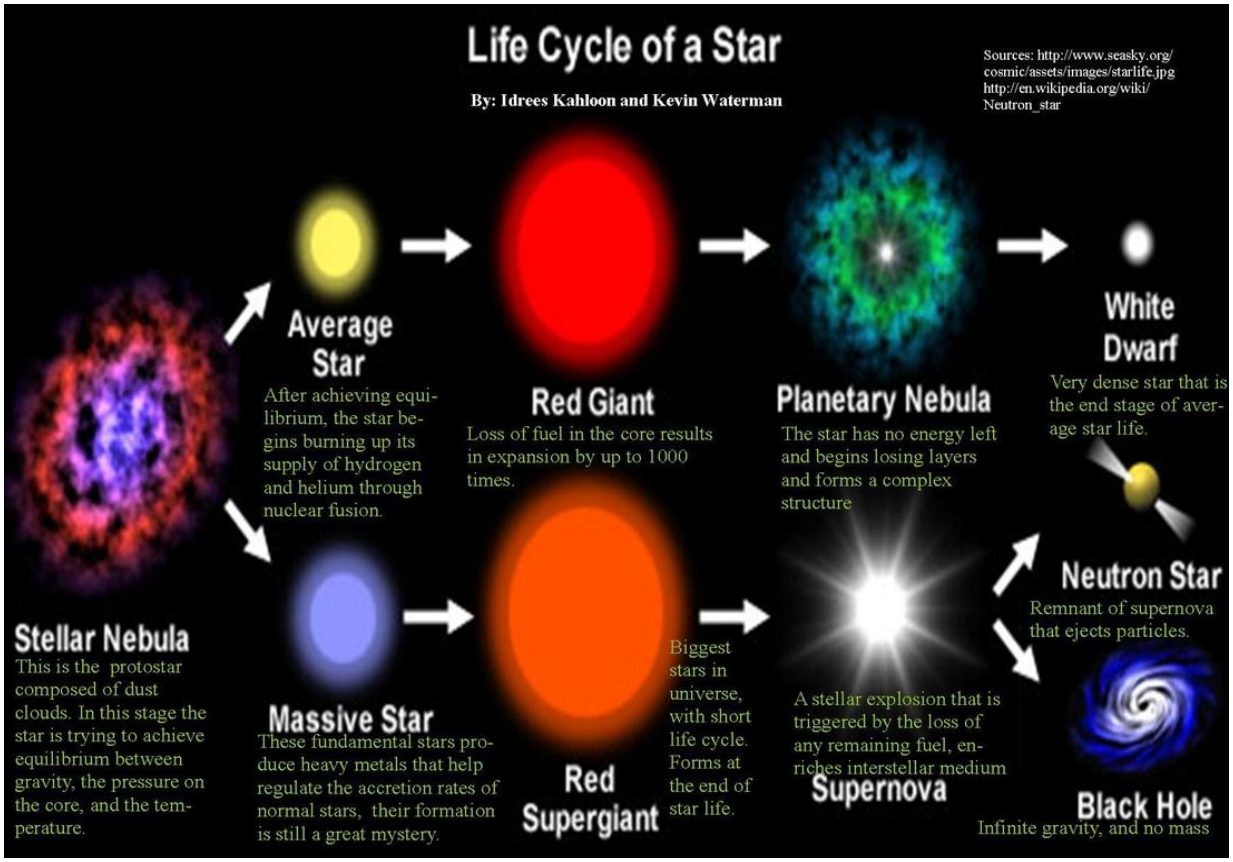
- A star is a luminous globe of gas producing its own heat and light by nuclear reactions (nuclear fusion).
- They are born from nebulae and consist mostly of hydrogen and helium gas.

RED GIANT

- This is a large bright star with a cool surface
- It is formed during the later stages of the evolution of a star like the Sun, as it runs out of hydrogen fuel at its centre.
- Very large stars (red giants) are often called Super Giants.

RED DWARF

- These are very cool, faint and small stars, approximately one tenth the mass and diameter of the Sun.
- They burn very slowly and have estimated lifetimes of 100 billion years.
- Proxima Centauri and Barnard's Star are red dwarfs.



WHITE DWARF

- This is very small, hot star, the last stage in the life cycle of a star like the Sun.
- White dwarfs have a mass similar to that of the Sun, but only 1% of the Sun's diameter; approximately the diameter of the Earth.

SUPERNOVA

- This is the explosive death of a star, and often results in the star obtaining the brightness of 100 million suns for a short time.
- There are two general types of Supernova:-
    - **Type I** These occur in binary star systems in which gas from one star falls on to a white dwarf, causing it to explode.
    - **Type II** These occur in stars ten times or more as massive as the Sun, which suffer runaway internal nuclear reactions at the ends of their lives, leading to an explosion. They leave behind neutron stars and black holes.

NEUTRON STARS

- These stars are composed mainly of neutrons and are produced when a supernova explodes, forcing the protons and electrons to combine to produce a neutron star.
- Neutron stars are very dense.
- Typical stars having a mass of three times the Sun but a diameter of only 20 km.
- If its mass is any greater, its gravity will be so strong that it will shrink further to become a black hole.
- Pulsars are believed to be neutron stars that are spinning very rapidly.

BLACK HOLES

- Black holes are believed to form from massive stars at the end of their lifetimes.
- The gravitational pull in a black hole is so great that nothing can escape from it, not even light.
- The density of matter in a black hole cannot be measured.
- Black holes distort the space around them, and can often suck neighbouring matter into them including stars.

2. ENVIRONMENT

2.1 Forest Fire Killed Koalas

Why in News?

Hundreds of koalas are feared to have burned to death in an out-of-control bushfire on Australia's east coast.

What are the types of forests in Australia?

- Mangrove Forests
- Acacia Forests
- Callitris Forests
- Casuarina Forests
- Eucalypt Forests
- Melaleuca Forests
- Rainforests

What are the positive effects of forest fire?

- Cleaning up forests of dead and decaying matter (natural fuel during drought periods)
- Maintaining ecosystem balance by removing diseased plants and harmful insects
- Regenerating seeds through increased sunlight

What are the negative effects of forest fire?

- Damage the habitat of the environment—which depends on the soil type and the fire's intensity
- Affect the species population and distribution after an incident
- Destroy homes and buildings
- Incur costly evacuations and destruction
- Create heavy smog that is harmful to living things
- Take animal and human lives

2.2 Green Crackers

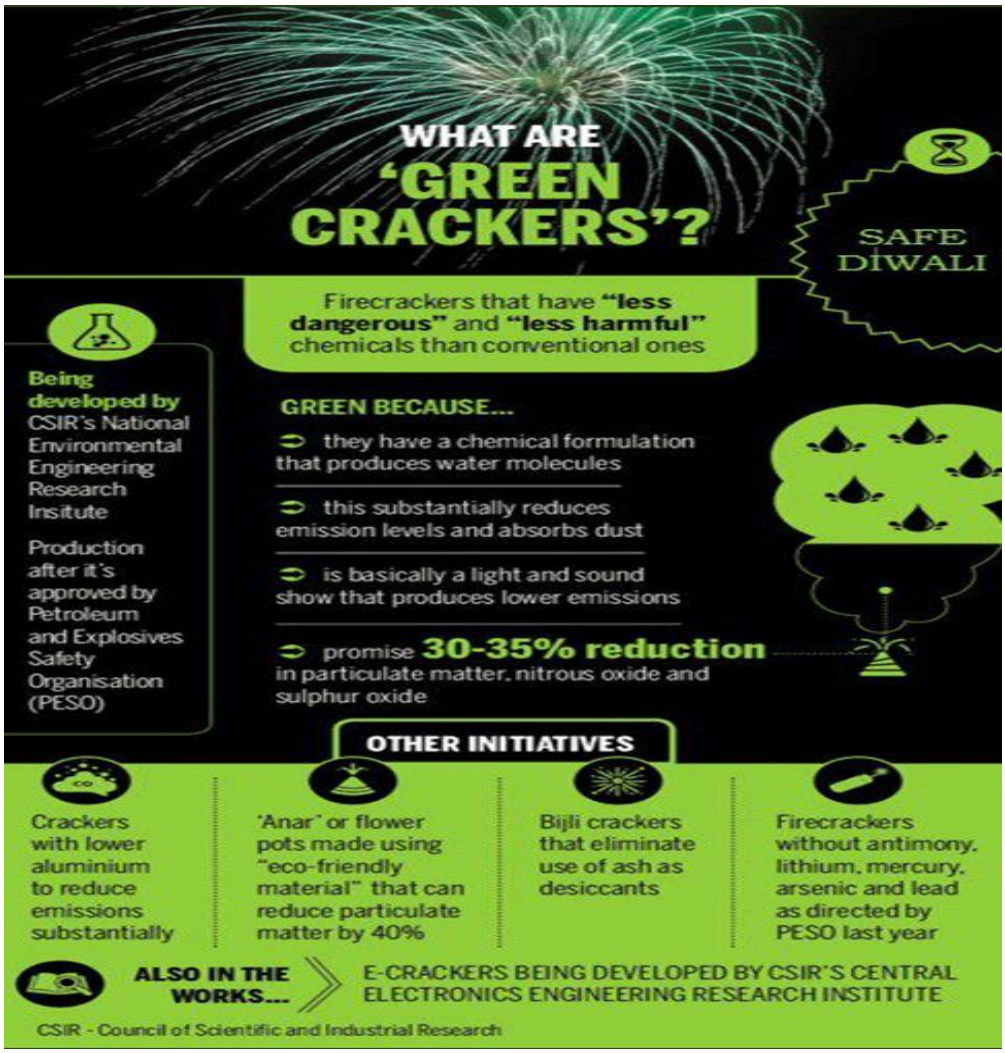
Why in News?

Delhi's Air quality became very poor post diwali.

What are green crackers?

- 'Green' crackers were researched and developed by scientists at CSIR-NEERI as per the court's directions.
- 'Green' crackers have a small shell size compared to traditional crackers.
- They are produced using less harmful raw materials and have additives which reduce emissions by suppressing dust.
- Green crackers don't contain banned chemicals such as lithium, arsenic, barium and lead.
- The green crackers developed by CSIR do not contain barium nitrate — one of the key ingredients of traditional firecrackers.
- They are called Safe Water Releaser (SWAS), Safe Thermite Cracker (STAR) and Safe Minimal Aluminium (SAFAL) crackers.

- Green crackers release water vapour and don't allow the dust particles to rise.
- They are designed to have 30% less particulate matter pollution.
- QR codes on green cracker packages will help consumers scan and identify counterfeits.



2.3 Microglia

Why in News?

Researchers have found that immune cells called microglia, which play an important role in reorganising the connections between nerve cells, fighting infections, and repairing damage, are also primarily active while we sleep.

What is microglia?

- Microglia serve as the brain's first responders,
  - patrolling the brain and spinal cord
  - springing into action to stamp out infections
  - gobble up debris from dead cell tissue.
- This research shows that the signals in our brain that modulate the sleep and awake state also act as a switch that turns the immune system off and on.
- The microglia help maintain the health and function of the synapses and prune connections between nerve cells when they are no longer necessary for brain function.

What are the findings of the study?

- The current study points to the role of norepinephrine, a neurotransmitter that signals arousal and stress in the central nervous system.

- This chemical is present in low levels in the brain while we sleep, but when production ramps up it arouses our nerve cells, causing us to wake up and become alert.
- The study showed that norepinephrine also acts on a specific receptor, the beta2 adrenergic receptor, which is expressed at high levels in microglia.
- When this chemical is present in the brain, the microglia slip into a sort of hibernation.
- The study, which employed an advanced imaging technology that allows researchers to observe activity in the living brain, showed that when mice were exposed to high levels of norepinephrine, the microglia became inactive and were unable to respond to local injuries and pulled back from their role in rewiring brain networks.

2.4 Subsistence Farming

What is Subsistence farming?

- Subsistence farming is form of farming in which nearly all of the crops or livestock raised are used to maintain the farmer and the farmer's family, leaving little, if any, surplus for sale or trade.
- Preindustrial agricultural peoples throughout the world have traditionally practiced subsistence farming.
- Some of these peoples moved from site to site as they exhausted the soil at each location.

What is the difference between commercial and subsistence farming?

BASIS FOR COMPARISON	SUBSISTENCE FARMING	COMMERCIAL FARMING
Meaning	The farming practice in which crops are raised for personal consumption, it is known as subsistence farming.	The farming practice, in which the farmer grows crops for the purpose of trade, it is called commercial farming.
Nature	Labor intensive	Capital intensive
Area	It is practiced in small area.	It is practiced in large area.
Productivity	It is enhanced through the use of manures.	It is enhanced through higher doses of modern inputs.
Crops grown	Food grains, fruits and vegetables	Cash crops and cereals
Method of irrigation	It depends on monsoon.	It uses modern irrigation methods.
Cultivation	Traditional methods are used.	Machines are used.

3. INNOVATION

3.1 BHIM 2.0 Launched

Why in News?

Government launches BHIM 2.0 with new functionalities, additional language support

What is BHIM UPI?

- The BHIM (Bharat Interface for Money) app was launched by PM Narendra Modi on 30th December 2016.
- Its main aim was to facilitate easy cashless payments post demonetisation and create a push towards a 'digital economy'.
- Since then, the app has been actively accepted by 102 partnering banks and been downloaded over 36 million times.
- It was named after the architect of the Indian constitution Dr BR Ambedkar, the BHIM app is an aggregator of Unified Payments Interface (UPI) services across various banks.
- Developed by the not-for-profit National Payments Corporation of India (NPCI), BHIM has been at the forefront of creating a digital infrastructure for financial transactions in India.

What does BHIM do?

- The BHIM app enables a range of cashless transactions – through your bank account, mobile number, QR code, or by creating a unique digital identity, also called a virtual payment address (VPA).
- Using your bank-registered mobile number and a bank ID, you can register your unique VPA to make or receive payments.

3.2 Dirac Metals

Why in News?

Researchers have discovered special properties in a class of materials called "semi-Dirac metals".

What are Dirac metals?

- Normal metals like gold and silver are good conductors of electricity.
- A key aspect that decides the quality of conduction is the way energy depends on the momentum of electrons.
- Dirac metals differ from normal metals in that the energy depends linearly on the momentum.
- This difference is responsible for their unique properties.
- Semi-Dirac metals behave like Dirac metals in one direction and like normal metals in the perpendicular directions (since their microscopic structure is different along the two directions).
- Within any material, charge carriers, such as electrons, acquire an effective mass which is different from their bare mass depending on the nature of the material.
- The effective mass and the number of states available for the electron to occupy when it is excited by an electric field, for example, determine the conductivity and other such properties.
- This is also true of a semi-Dirac metal.
- The effective mass becomes zero for conduction along a special direction.

3.3 Nobel Prize for physics

Why in News?

The royal Swedish Academy of Sciences announced that the Nobel Prize in Physics.

Who won Nobel prize for physics?

The prize would go to three people:

- One half of it would be shared by Michel Mayor and Didier Queloz of the University of Geneva, for discovering for the first time a planet outside our solar system orbiting a Sun-like star;
- The other half would go to James Peebles, Princeton University, for his contribution to physical cosmology.

- The scientists were awarded for discoveries that added "new perspectives on our place in the universe".

What is an exoplanet?

- An exoplanet is a planet outside our solar system, usually orbiting another star.
- They are also sometimes called "extrasolar planets", "extra-" implying that they are outside of our solar system.

What are the ways to find a planet?

- **WATCHING FOR WOBBLE -** Radial Velocity
- **SEARCHING FOR SHADOWS -** Transit
- **TAKING PICTURES -** Direct Imaging
- **LIGHT IN A GRAVITY LENS -** Gravitational Microlensing
- **MINISCULE MOVEMENTS -** Astrometry

What is dark matter?

- Unlike normal matter, dark matter does not interact with the electromagnetic force.
- This means it does not absorb, reflect or emit light, making it extremely hard to spot.
- In fact, researchers have been able to infer the existence of dark matter only from the gravitational effect it seems to have on visible matter.
- Dark matter seems to outweigh visible matter roughly six to one, making up about 27% of the universe.

3.4 Time for Quantum Computers?

Why in News?

Researchers at Google say they have achieved 'quantum supremacy'.

What is 'quantum supremacy'?

- It's when the superior potential of quantum computing is finally achieved in practice — effectively superseding existing forms of computing.
- In other words quantum supremacy is the goal of demonstrating that a programmable quantum device can solve a problem that classical computers practically cannot.

What's different about quantum computing?

- Conventional computers use 'bits' — or ones and zeroes — as the basis of their calculations.
- In simple terms these represent 'yes' and 'no', or 'on' and 'off'.
- In combination, bits can be used to handle logical tasks.
- Quantum computing makes use of a property of sub-atomic particles in which they can simultaneously exist in different states.
- A quantum bit, or qubit, can thus be both one and zero at the same time.
- In the jargon, this is called superposition.

What makes quantum computers so powerful?

- Another property of sub-atomic particles is for them to become 'entangled' — meaning that they can influence each other's behaviour in an observable way.
- Combining entanglement with superposition leads to exponential increases in computing power with each additional qubit.
- The Sycamore processor designed by Google, a unit of Silicon Valley technology giant Alphabet, had 54 qubits arranged in a two-dimensional grid.
- In the experiment only 53 could be made to work - still enough to produce a successful result.

What is Quantum entanglement (QE)?

- Quantum entanglement is a quantum mechanical phenomenon.
- In QE the quantum states of two or more objects have to be described with reference to each other, even though the individual objects may be spatially separated.
- This leads to correlations between observable physical properties of the systems.

- Measurements of physical properties such as position, momentum, spin, and polarization, performed on entangled particles are found to be correlated.
- For example, it is possible to prepare two particles in a single quantum state such that when one is observed to be spin-up, the other one will always be observed to be spin-down and vice versa, this despite the fact that it is impossible to predict, according to quantum mechanics, which set of measurements will be observed.
- As a result, measurements performed on one system seem to be instantaneously influencing other systems entangled with it.
- But quantum entanglement does not enable the transmission of classical information faster than the speed of light.
- Quantum entanglement has applications in the emerging technologies of quantum computing and quantum cryptography, and has been used to realize quantum teleportation experimentally.

3.5 WhatsApp sues Israeli firm

Why in News?

The Israeli technology firm NSO Group tried to infect approximately 1,400 "target devices" with malicious software to steal valuable information.

What is Pegasus?

- Pegasus is meant to infiltrate smartphones silently and work on three things -- collect historic data on device, continuously monitor activity and transmit this data to a third party.
- Other than Android and iOS systems, Pegasus can also penetrate Symbian and BlackBerry-based devices.
- The malware can infect devices via phishing text messages that trick users into clicking a particular link, using the over-the-air update system and more.
- In WhatsApp's case, it used a vulnerability in the app that allowed infection through missed video calls.
- In all forms of installations, the spyware completes the process in the background, completely out of the user's notice.
- This, combined with the fact that Pegasus doesn't require the user's attention is one of the reasons why the spyware is so dangerous and popular amongst security contractors.

4. BIO-TECHNOLOGY

4.1 Anthrax

Why in News?

Veterinarians have confirmed anthrax as the cause of death of two Asiatic water buffaloes in central Assam's Pobitora Wildlife Sanctuary.

What is anthrax?

- Anthrax is a serious infectious disease caused by gram-positive, rod-shaped bacteria known as Bacillus anthracis.
- Anthrax can be found naturally in soil and commonly affects domestic and wild animals around the world.
- People can get sick with anthrax if they come in contact with infected animals or contaminated animal products.
- Contact with anthrax can cause severe illness in both humans and animals.
- Anthrax is **not** contagious, which means you can't catch it like the cold or flu.

How do animals get infected with anthrax?

- Domestic and wild animals such as cattle, sheep, goats, antelope, and deer can become infected when they breathe in or ingest spores in contaminated soil, plants, or water.
- In areas where domestic animals have had anthrax in the past, routine vaccination can help prevent outbreaks.

How do people get infected with anthrax?

- People get infected with anthrax when spores get into the body.
- When anthrax spores get inside the body, they can be "activated."
- When they become active, the bacteria can multiply, spread out in the body, produce toxins (poisons), and cause severe illness.
- This can happen when people breathe in spores, eat food or drink water that is contaminated with spores, or get spores in a cut or scrape in the skin.

4.2 Decline in TB

Why in News?

India registered 26.9 lakh incidents of tuberculosis (TB) in 2018, a decline of nearly 50,000 patients compared to 2017 according to a World Health Organisation report.

What are the other outcomes of the report?

- Globally, India accounted for 27% of all TB incidents, the highest.
- The rate of decline of the number of cases, reported by the WHO, has marginally increased between 2014 and 2018.
- India has aimed to eliminate tuberculosis by 2025.
- Nearly 5.5 lakh TB incidents were not reported in India in 2018.
- Among States and U.T.s, Delhi and Chandigarh had the highest notified TB cases per one lakh of the population while Tripura and Kerala had the least.

Where India stands?

- India recorded 32 fatalities per lakh people in 2018.
- India's standing was comparable to Bangladesh, Afghanistan and Gambia.

What is TB?

- Tuberculosis (TB) is caused by bacteria, *Mycobacterium tuberculosis*.
- It most often affects lungs.
- Tuberculosis is curable and preventable.
- TB is spread from person to person through the air.
- You get TB when you breathe in TB bacteria, released by someone in air through cough or sneeze.

What is National Strategic Plan (NSP) 2017 – 2025?

- The National Strategic Plan (NSP) 2017 - 2025 is the plan produced by the government of India (GoI) which sets out the government to eliminate TB in India.
- The NSP 2017 - 2025 describes the activities and interventions that the GoI will bring about significant change in the incidence, prevalence and mortality from TB.
- This is in addition to what is already going on in the country.
- The NSP sets out the recommendations of the GoI.

4.3 Global Hunger Index 2019

Why in News?

India is ranked 102 of 117 countries in the Global Hunger Index 2019, behind its neighbours Nepal, Pakistan and Bangladesh.

How are the GHI scores calculated?

- GHI scores are calculated using a three-step process that draws on available data from various sources to capture the multidimensional nature of hunger.
- First, for each country, values are determined for four indicators:

1. **UNDERNOURISHMENT:** the share of the population that is undernourished (that is, whose caloric intake is insufficient);

2. **CHILD WASTING:** the share of children under the age of five who are wasted (that is, who have low weight for their height, reflecting acute undernutrition);
3. **CHILD STUNTING:** the share of children under the age of five who are stunted (that is, who have low height for their age, reflecting chronic undernutrition); and
4. **CHILD MORTALITY:** the mortality rate of children under the age of five (in part, a reflection of the fatal mix of inadequate nutrition and unhealthy environments).

- Second, each of the four component indicators is given a standardized score on a 100-point scale based on the highest observed level for the indicator on a global scale in recent decades.

Third, standardized scores are aggregated to calculate the GHI score for each country, with each of the three dimensions (inadequate food supply; child mortality; and child undernutrition

4.4 National Health Profile 2019

Why in News?

India's life expectancy rises to 68.7 years, says National Health Profile 2019

What are the findings?

- National Health Profile report notes that diabetes and hypertension rate is high among Indians while dengue and chikungunya are a cause of great concern to public health.
- Life expectancy in India has increased from 49.7 years in 1970-75 to 68.7 years in 2012-16.
- For the same period, the life expectancy for females is 70.2 years and 67.4 years for males.
- On the non-communicable diseases (NCD), the survey notes that out of 6.51 crore patients who attended NCD clinics
    - 4.75% people are diagnosed with diabetes
    - 6.19% are diagnosed with hypertension
    - 0.3% are diagnosed with cardiovascular diseases
    - 0.10% are diagnosed with stroke and
    - 0.26% are diagnosed with common cancers.
- The highest population density: 11,320 (National Capital Territory of Delhi)
- Arunachal Pradesh reported the lowest population density of 17.
- On demographics, the survey found the high incidence of the young and economically active population.
- The survey notes that 27% of the total estimated population of 2016 were below the age of 14 years and majority (64.7%) of the population were in the age group of 15-59 years i.e. economically active, and 8.5% population were in the age group of 60-85 plus years.
- There has been consistent decrease in the birth rate, death rate and natural growth rate in India since 1991 to 2017.
- As on 2017, India has registered
- birth rate of 20.2 per population of 1,000
- death rate of 6.3 while the natural growth rate was 13.9 per population of 1,000.
- The birth rate in rural areas was higher than in the urban.
- Similarly, the death rate and natural growth rate were also higher in rural areas as compared to the urban.
- The population, however, continues to grow, as the decline in the birth rate is not as rapid as the decline in the death rate.
- The infant mortality rate (IMR) has declined considerably (33 per 1,000 live births in 2016), however differentials of rural (37) and urban (23) are still high.

4.5 New technique to propagate plants

Why in News?

Mettupalayam-based S Rajarathnam has developed a technique to propagate plants using leaves

What is plant propagation?

- Plant propagation is the process of creating new plants.
- There are two types of propagation: sexual and asexual.

What is sexual propagation?

- Sexual reproduction is the union of the pollen and egg, drawing from the genes of two parents to create a new, third individual.
- Sexual propagation involves the floral parts of a plant.
- The advantages of sexual propagation are that it may be cheaper and quicker than other methods
- It may be the only way to obtain new varieties and hybrid vigor.
- In certain species, it is the only viable method for propagation; and it is a way to avoid transmission of certain diseases.

What is asexual propagation?

- Asexual propagation involves taking a part of one parent plant and causing it to regenerate itself into a new plant.
- The resulting new plant is genetically identical its parent.
- Asexual propagation involves the vegetative parts of a plant: stems, roots, or leaves.
- Asexual propagation has advantages, too.
- It may be easier and faster in some species; it may be the only way to perpetuate some cultivars;
- It bypasses the juvenile characteristics of certain species.

4.6 New tool for Gene-editing

Why in News?

Researchers at the Delhi-based Institute of Genomics and Integrative Biology (CSIR-IGIB) have discovered a protein variant from a different species of bacteria that can edit the DNA with very high precision.

What is genome editing?

- **Definition:** Gene editing (or genome editing) is the insertion, deletion or replacement of DNA at a specific site in the genome of an organism or cell.
- It is usually achieved in the lab using engineered nucleases also known as *molecular scissors*
- These technologies allow genetic material to be added, removed, or altered at particular locations in the genome.

What are the gene-editing techniques available?

- Editing the genome can be achieved using engineered nucleases such as CRISPR-Cas9, ZFNs or TALENs, viral systems such as rAAV (*Recombinant Adeno-Associated Virus*) and also transposons.
- A recent one is known as CRISPR-Cas9, which is short for clustered regularly interspaced short palindromic repeats and CRISPR-associated protein 9.

4.7 Nobel Prize in Physiology or Medicine 2019

Why in News?

The Nobel Prize in Physiology or Medicine 2019 was awarded jointly to William G. Kaelin Jr, Sir Peter J. Ratcliffe and Gregg L. Semenza "for their discoveries of how cells sense and adapt to oxygen availability."

What are the types of cells in the human body?

- There are over 200 different cell types in the human body.
- Each type of cells is specialised to carry out a particular function.
- Different tissues then combine and form specific organs.

What are the most important types of cells?

Stem cells	Embryonic stem cells Adult stem cells

Red blood cells	Erythrocytes
White blood cells	Granulocytes (neutrophils, eosinophils, basophils) Agranulocytes (monocytes, lymphocytes)
Platelets	Fragments of megakaryocytes
Nerve cells	Neurons Neuroglial cells
Muscle cells	Skeletal Cardiac Smooth
Cartillage cells	Chondrocytes
Bone cells	Osteoblasts Osteoclasts Osteocytes Lining cells
Skin cells	Keratinocytes Melanocytes Merkel cells Langerhans cells
Endothelial	Lining blood vessels
Epithelial cells	Lining body cavities
Fat cells	White adipocytes Brown adipocytes
Sex cells	Spermatozoa Ova

4.8 Osteoporosis

Why in News?

Osteoporosis is a silent disease that with age rips up the body's bone architecture.

WHAT IS OSTEOPOROSIS?

- Osteoporosis, which literally means porous bone, is a disease in which the density and quality of bone are reduced.
- As bones become more porous and fragile, the risk of fracture is greatly increased.
- The loss of bone occurs silently and progressively.
- Often there are no symptoms until the first fracture occurs.

What causes osteoporosis?

- Our bones are living tissue and constantly changing.
- From the moment of birth until young adulthood, bones are developing and strengthening.
- Our bones are at their most dense in our early 20s – called peak bone mass.
- As we age some of our bone cells begin to dissolve bone matrix (resorption), while new bone cells deposit osteoid (formation).
- This process is known as remodeling.
- For people with osteoporosis, bone loss outpaces the growth of new bone.
- Bones become porous, brittle and prone to fracture.

4.9 Randomised Controlled Trial

Why in News?

The new Economics Nobel laureates - Abhijit Banerjee, Esther Duflo and Michael Kremer - are considered to be instrumental in using randomised controlled trials to test the effectiveness of various policy interventions to alleviate poverty.

What is a randomised controlled trial?

- A randomised controlled trial is an experiment that is designed to isolate the influence that a certain intervention or variable has on an outcome or event.
- A social science researcher who wants to find the effect that employing more teachers in schools has on children's learning outcomes, for instance, can conduct a randomised controlled trial to find the answer.
- The use of randomised controlled trials as a research tool was largely limited to fields such as biomedical sciences where the effectiveness of various drugs was gauged using this technique.
- Mr. Banerjee and Ms. Duflo later conducted similar experiments in India and further popularised RCTs through their book *Poor Economics*, published in 2011.

4.10 Transfat Elimination

Why in News?

Consumer organisations and health experts have written to the Union Health Ministry asking it to advance the 2022 deadline for the elimination of trans-fatty acids in Indian food to 2021.

What are *trans* fats?

- There are two broad types of trans fats found in foods
  - Naturally-occurring and
  - Artificial *trans* fats.
- Naturally-occurring trans fats are produced in the gut of some animals and foods made from these animals (e.g., milk and meat products) may contain small quantities of these fats.
- Artificial *trans* fats (or *trans* fatty acids) are created in an industrial process that adds hydrogen to liquid vegetable oils to make them more solid.
- The primary dietary source for *trans* fats in processed food is "partially hydrogenated oils."

How do *trans* fats affect my health?

- *Trans* fats raise your bad (LDL) cholesterol levels and lower your good (HDL) cholesterol levels.
- Eating *Trans* fats increases your risk of developing heart disease and stroke.
- It's also associated with a higher risk of developing type 2 diabetes.

4.11 Type 3 WPV Eradicated

Why in News?

Wild poliovirus type 3 has been eradicated, the World Health Organisation said.

What is polio?

- Polio (also known as poliomyelitis) is a highly contagious disease caused by a virus that attacks the nervous system.
- Children younger than 5 years old are more likely to contract the virus than any other group.
- According to the World Health Organization (WHO), 1 in 200 polio infections will result in permanent paralysis.

How does the poliovirus infect someone?

- As a highly contagious virus, polio transmits through contact with infected feces.
- Objects like toys that have come near infected feces can also transmit the virus.
- Sometimes it can transmit through a sneeze or a cough, as the virus lives in the throat and intestines. This is less common.
- People living in areas with limited access to running water or flush toilets often contract polio from drinking water contaminated by infected human waste.