

INTERNATIONAL RELATION**Russia withdrawing Support from International Space Station**

Recently, after Russia invaded Ukraine, the US imposed sanctions on Russia including a ban on transfer of technology and on Russian banks. Following this, the Russian space agency Roscosmos held that the State Corporation will not cooperate with Germany on joint experiments in the Russian segment of the International Space Station (ISS).

What is Russia's role in maintaining the ISS?

- The ISS is built with the cooperation of scientists from five international space agencies — NASA of the US, Roscosmos of Russia, JAXA of Japan, Canadian Space Agency and the European Space Agency.
- Each agency has a role to play and a share in the upkeep of the ISS. Both in terms of expense and effort, it is not a feat that a single country can support.
- Russia's part in the collaboration is the module responsible for making course corrections to the orbit of the ISS.
- Further, the Russian segment ensures that the space station's orbit is corrected to keep it away from space debris, roughly 11 times a year.
- It also ferry astronauts to the ISS from the Earth and back.

What could be the impact of Russia's Withdrawal?

- Due to its enormous weight and the ensuing drag, the ISS tends to sink from its orbit at a height of about 250 miles above the Earth. It has to be pushed up to its original line of motion every now and then.
- Russia's withdrawing from its segment of the ISS cooperation spacecraft could affect correcting the orbit of the ISS. This meant the ISS could fall into the sea or on the land.
- ISS would likely crash down on some country, but most probably not Russia itself. The orbit of the ISS does not fly over Russian territory mostly.
- However, dropping of ISS poses a greater risk to regions that are closer to the equator. But this is only a probability, as it can move or disintegrate. In case of this eventuality, people in the ISS will be brought back, modules can be detached thereby making it much smaller which will ensure that it disintegrates before touching the earth.

What is the International Space Station (ISS)?

- The ISS is the most complex international scientific and engineering project in history and the largest structure humans have ever put into space.
- This high-flying satellite is a laboratory for new technologies and an observation platform for astronomical, environmental and geological research.
- As a permanently occupied outpost in outer space, it serves as a stepping stone for further space exploration.
- The space station flies at an average altitude of 400 kilometers above Earth. It circles the globe every 90 min. at a speed of about 28,000 kph.
- In one day, the station travels about the distance it would take to go from Earth to the moon and back.
- The space station can rival the brilliant planet Venus in brightness and appears as a bright moving light across the night sky.
- It can be seen from Earth without the use of a telescope by night sky observers who know when and where to look.
- Five different space agencies representing 15 countries built the USD 100-billion International Space Station and continue to operate it today.
- The International Space Station was taken into space piece-by-piece and gradually built in orbit.
 1. It consists of modules and connecting nodes that contain living quarters and laboratories, as well as exterior trusses that provide structural support, and solar panels that provide power.
 2. The first module, Russia's Zarya module, launched in 1998.
- The first space station crews were three-person teams, though after the tragic Columbia shuttle disaster the crew size temporarily dropped to two-person teams.
- The space station reached its full six-person crew size in 2009 as new modules, laboratories and facilities were brought online.
- Current plans call for the space station to be operated through at least 2020. NASA has requested an extension until 2024.

Are there any substitutes for Russia?

- There are right now two possibilities. SpaceX's dragon module and Boeing's Starliner can dock with the ISS.
- Until SpaceX's dragon spacecraft came into the picture the Russian spacecrafts were the only way of reaching the ISS and returning.

SOCIAL JUSTICE

Bahini Scheme

The Sikkim government is set to announce a scheme (Bahini) to install vending machines to provide free sanitary pads. This is the first time that a state government has taken a decision to cover all girls studying in Classes 9-12.

What is the Purpose of the Scheme?

- It aims at providing "100% access to free and safe sanitary pads to secondary and senior secondary school going girls".
- It is also aimed to curb dropout of girls from schools and raise awareness about menstrual hygiene.
- The scheme is based on an experiment the state government initiated in 2018, in collaboration with Sulabh International, where vending machines were installed in some schools. Sulabh International is an India-based social service organization that works to promote human rights, environmental sanitation, non-conventional sources of energy, waste management and social reforms through education.

What is the State of Menstrual Health in India?

Data:

- According to the National Family Health Survey (NFHS-4) 2015-16, India has over 355 million menstruating women. However, only 36% of women were reported as using sanitary napkins, locally or commercially produced.
- The percentage of women using menstrual products did improve significantly across the country, especially in Daman and Diu and Dadra and Nagar Haveli, West Bengal and Bihar, as estimated in the first phase of the recently released NFHS-5. Despite this, menstrual health remains a low-priority issue in India marred with taboos, shame, misinformation, and poor access to sanitation facilities and menstrual products.

Issues:

- **Societal restrictions:** Societal restrictions during menstruation violate women's right to health, equality and privacy. Several anecdotes reveal that women and girls are kept in isolation, not allowed to enter religious places or kitchens, play outside or even go to schools during menstruation.
- **School Drop out:** A survey conducted under the Integrated Child Development Services (ICDS) scheme by the Ministry of Women and Child Development (MoWCD) in 2018-19 reported that more than one-fourth of total girls enrolled in class VI-VIII drop out of school as soon as they hit puberty.
- **Inconsistent Access to Education:** The experience of menstruation for young girls is even more difficult due to inconsistent access to education on menstrual health and puberty.
- **Reduced Participation in the Workforce:** Many employers see menstruating women as a problem as they associate periods with inefficiency in work and reduced participation in the workforce. There are anecdotal examples of corporate workplaces showing insensitivity towards menstruating women fearing loss of productivity.

Related Initiatives:

- **Central Government:**
 1. In 2015, the central government introduced the national guidelines on menstrual hygiene management.
 2. Menstrual Hygiene Scheme (2011) and the Rashtriya Kishor Swasthya Karyakram (in 2014), have been launched to promote menstrual hygiene amongst adolescent girls in the age group of 10 to 19.
 3. Through the Suidha initiative, the government distributed more than 5 crore brand sanitary pads at Re 1 from 6,000 Jan Aushadhi Kendras.
- **State Government:**
 1. Apart from central government schemes, state governments have also implemented programmes to distribute sanitary pads in schools in Rajasthan, Uttar Pradesh, Odisha, Maharashtra, Chhattisgarh, Andhra Pradesh, and Kerala.
 2. The Bihar government provides Rs 300 under the Kishori Swasthya Yojana to adolescent girls to buy sanitary pads.

Way Forward

- The need of the hour is to focus on a strategy that converges key departments in the government — health, education, women and child development and rural development among others — and improves accountability towards issues related to menstrual health management.
- The way forward lies in a community-based approach in which local influencers and decision-makers are sensitised to champion the issue and behavioural change campaigns targeted at both men and women are deployed to dispel myths and misconceptions.
- There is also a huge opportunity to create public-private collaborations to drive such campaigns and increase access to affordable menstrual hygiene products for rural and semi-urban regions. This could be done through the installation of sanitary pad vending machines at key public places, workplaces, schools, and colleges, as well as Anganwadi centres or childcare centres for rural areas.
- It is crucial to acknowledge that menstrual health is not just a women's issue, but a matter of human rights.

GOVERNANCE

Blockchain Gaming in India

The vast scope and potential of blockchain technology has attracted the gaming industry over the past few years. In India too, gaming industries are exploring this option. Blockchain is a decentralised database that stores information. It relies on technology that allows for the storage of identical copies of this information on multiple computers in a network.

What is Blockchain Gaming?

- Blockchain games are online video games that are developed integrating blockchain technology into them. It includes elements that use cryptography-based blockchain technologies like Cryptocurrency or Non-Fungible Tokens (NFTs).
- These elements are used by players to buy, sell, or trade with other players, with the game publisher taking a fee from each transaction as a form of monetization.
- Example of Blockchain Game: In 2017, Dapper Labs' had developed the first ever blockchain game called CryptoKitties. In the game, people can virtually experience the joy of adopting and breeding a cat (CryptoKittie), without taking up the responsibility of bringing one home. Each CryptoKittie is a Non-Fungible Token ("NFT").

What are elements of Blockchain Games?

- **NFTs:** NFTs represent in-game virtual assets that can be owned by players, such as maps, armor or land.
 1. These NFTs act as asset tags, identifying ownership of the in-game assets, and are stored on the blockchain.
 2. Being on the blockchain allows the player to have a secure record of ownership of the in-game assets and also gives the assets the ability to outlive the game itself.
 3. Based on the manner in which the games are designed, it also allows for the in-game assets to be transferred from one game to another.
 4. It also creates transparency, since ownership records can independently be verified by any third party as well.
 5. In doing so, it makes in-game assets marketable and creates a decentralized market, where they can be bought and sold by people.
- **Cryptocurrency:**
 1. Cryptocurrency, such as tokens based on the Ethereum blockchain, may be used for the purchase of in-game assets.
 2. These in-game purchases usually enable gamers to buy items like extra lives, coins and so on directly from the game.

What is legality of Games in India?

- **Legal Jurisdiction:** The state legislators are, vide Entry No. 34 of List II (State List) of the Seventh Schedule of the Constitution of India, given exclusive power to make laws relating to betting and gambling.
- **Types Games in India:** Most Indian states regulate gaming on the basis of a distinction in law between 'games of skill' and 'games of chance'.
- **Test of Type of Game:** As such, a 'dominant element' test is to be utilized to determine whether chance or skill is the dominating element in determining the result of the game. This 'dominant element' may be determined by examining whether factors such as superior knowledge, training, experience, expertise or attention of a player have a material impact on the outcome of the game.

- **Status of Type of Games Allowed:** Staking money or property on the outcome of a 'game of chance' is prohibited and subjects the guilty parties to criminal sanctions.
 1. However, placing any stakes on the outcome of a 'game of skill' is not illegal per se and may be permissible.
 2. It is important to note that the Supreme Court recognized that no game is purely a 'game of skill' and almost all games have an element of chance.

Common Gaming House:

- Another concept common to the gaming law in most states is the idea of a 'common gaming house'.
- Owning, keeping, or having charge of a common gaming house or being present for the purpose of gaming in any such common gaming house is ordinarily prohibited in terms of these state gaming laws.
- Common gaming house is defined as any house, walled enclosure, room or place in which instruments of gaming are kept or used for the profit or gain.
- Pertinently, courts have clarified in the past that the mere charging of an extra fee to facilitate playing the game and / or to maintain the facilities may not necessarily be seen as making a profit or gain.

Where does blockchain gaming lie within this framework?

- Since blockchain is merely the underlying technology, there is no express regulation of it in India.
- It is important to note that most of the gaming laws were brought into effect prior to the internet era and, therefore, only contemplate regulation of gaming activities taking place in physical premises.
- However, as the law currently stands, each blockchain game must first pass muster as a 'game of skill', as against a 'game of chance', to legally be made available in most Indian states.
- It is also relevant to note that in the past, the Supreme Court has rejected the notion of video games being 'games of skill'.
 1. It held that the outcomes of these games could be manipulated by tampering with the machines used to play.
 2. Therefore, the element of skill of players could not be a dominant factor of the game.
- Since developers and publishers of blockchain games are likely to earn revenue / charge fee for offering such games, it does raise questions over whether they may be seen as playing a role analogous to that played by common gaming houses under Indian law.
- Further, the legality of blockchain games relies on the legality of cryptocurrency.
 1. Budget 2022-23, announced that the income from the transfer of any 'virtual digital assets' (which include cryptocurrency and non-fungible tokens) would be subject to income tax at the rate of 30%.
 2. Policy pronouncements of this nature would need to be carefully considered by publishers of blockchain games while designing their pricing models.

What intellectual property protections may be available to blockchain games?

- **Patent:** In terms of Section 3(k) of the Patent Act, 1970, computer programs are per se not inventions and hence, cannot be patented.
 1. However, judicial pronouncements in the past have clarified that if an invention has a technical contribution or a technical effect and is not merely a computer program per se, then it would be patentable.
 2. Thus, a patent for a blockchain game may be sought if it meets the requirements of novelty, involving an inventive step, and industrial application.
- **Trademarks:** A trademark is used as an identifying mark to determine the source of a particular good or service, and is obtained to protect the goodwill and reputation of the brand. Any distinguishing mark in a blockchain game or NFT that would allow consumers to identify the source of that particular game or NFT may be trademarked.
- **Copyrights:** In India, artistic work, musical work, cinematographic films, dramatic works, sound recordings and computer software are capable of being protected under copyright law. Although there is no specific provision in the Copyright Act that deals with video games, copyright protection of video games may be sought under the category of 'multimedia products'.

Way Forward

- The use of blockchain technology for online games is likely to be beneficial for game developers, publishers, and players.
- However, key to their growth is regulation which ensures that it is permissible to offer such games in the Indian territory and also offers protection in the form of intellectual property rights.

- Other concerns, such as privacy and cyber security, along with how financial regulations would apply to blockchain games, would also need to be addressed

PRELIMS FACT**Dandi March 1930**

Recently, the Prime Minister paid tributes to Mahatma Gandhi and all the eminent persons who Marched to Dandi (1930) in order to protest injustice and protect our nation's self-esteem. Earlier in 2021, a commemorative 'Dandi March' was launched, which was undertaken by 81 marchers from Sabarmati Ashram in Ahmedabad to Dandi in Navsari, a journey of 386 km.

What was the Dandi March?

- The Dandi March, also known as the Salt March and the Dandi Satyagraha was an act of nonviolent civil disobedience led by Mohandas Karamchand Gandhi.
- The march lasted from 12th March, 1930 to 6th April, 1930 as a direct action campaign of tax resistance and nonviolent protest against the British salt monopoly.
- On 12th March, Gandhiji set out from Sabarmati with 78 followers on a 241-mile march to the coastal town of Dandi on the Arabian Sea. There, Gandhi and his supporters were to defy British policy by making salt from seawater.
- At Dandi, thousands more followed his lead, and in the coastal cities of Bombay and Karachi, Indian nationalists led crowds of citizens in making salt.
- Civil disobedience broke out all across India, soon involving millions of Indians, and British authorities arrested more than 60,000 people. Gandhiji himself was arrested on 5th May, but the satyagraha continued without him.
- On 21st May, the poet Sarojini Naidu led 2,500 marchers on the Dharasana Salt Works, some 150 miles north of Bombay. The incident, recorded by American journalist Webb Miller, prompted an international outcry against British policy in India.
- In January 1931, Gandhiji was released from prison. He later met with Lord Irwin, the viceroy of India, and agreed to call off the satyagraha in exchange for an equal negotiating role at a London conference on India's future. In August 1931, Gandhiji traveled to the conference as the sole representative of the nationalist Indian National Congress. The meeting was a disappointment, but British leaders had acknowledged him as a force they could not suppress or ignore.

What was its Background?

- The Lahore Congress of 1929 had authorized the Congress Working Committee (CWC) to launch a programme of civil disobedience including non-payment of taxes.
- On 26th January 1930, "Independence Day" was observed, with the national flag being hoisted in different venues, and patriotic songs being sung.
- In February 1930, CWC meeting at Sabarmati Ashram, invested Gandhiji with full powers to launch the Civil Disobedience Movement at a time and place of his choice.
- Gandhiji's ultimatum to Lord Irwin, the Viceroy of India (1926-31), stating the minimum demands had been ignored and there was only one way out-civil disobedience.

What was the Effect of the Movement?

- Civil Disobedience in different forms continued in different provinces. Special stress was laid on the boycott of foreign goods.
- In eastern India, payment of chowkidari tax was refused. This no-tax campaign became very popular in Bihar.
- In Bengal, J.N. Sengupta defied Government laws by reading openly the books banned by the government.
- Defiance of forest laws assumed a mass character in Maharashtra.
- The movement had taken a fire hold in the provinces of U.P., Orissa, Tamil Nadu, Andhra Pradesh and Assam.

What is its Significance?

- Imports from Britain had fallen considerably. For example, imports of cloth from Britain had fallen by half.
- The movement was more widespread than the previous one. Mass participation including women, peasants, workers, students, urban elements like merchants, shopkeepers provided the Congress a new all-India status.
- The support that the movement had garnered from the poor and the illiterate both in the town and countryside was remarkable.
- For Indian women, the movement was the most liberating experience to date and can truly be said to have marked their entry into the public space.

- Although the Congress withdrew the Civil Disobedience in 1934, the movement received global attention and marked a critically important stage in the progress of the anti-imperialist struggle.

DAILY ANSWER WRITING PRACTICE

Qns. Nanotechnology in medicine has a myriad of applications as well as it offers some exciting possibilities which can revolutionise modern medicine. Discuss. (250 words)

Introduction

Nanotechnology is the science of materials at the molecular or subatomic level. It involves manipulation of particles smaller than 100 nanometres (one nanometre is one-billionth of a metre) and the technology involves developing materials or devices within that size — invisible to the human eye and often many hundred times thinner than the width of human hair. The physics and chemistry of materials are radically different when reduced to the nanoscale; they have different strengths, conductivity and reactivity, and exploiting this could revolutionise medicine.

Body

The contributions of Nanotechnology in medicine:

- **Diagnostics and screening:**
 1. There is an urgent need in the developing world for better disease diagnosis, and nanotechnology offers a multitude of options for detecting disease.
 2. Example: Fluorescent quantum dots could improve malaria diagnosis by targeting the blood cell's inner membrane.
 3. Similarly, carbon nanotubes, and other nanoparticles such as nanowires, have been used as biosensors to detect diseases such as HIV and cancer. Cancer biosensors can be made, for instance, by attaching nucleic acid probes to the ends of nanowires.
- **Drug delivery:**
 1. Nanotechnology could also revolutionise drug delivery by overcoming challenges such as how to sustain the release of drugs in the body and improving bioavailability — the amount of active ingredient per dose.
 2. Some drugs can now be delivered through 'nanovehicles'.
 3. For example liposomes, which can deliver the drug payload by fusing with cell membranes, have been used to encapsulate HIV drugs such as stavudine and zidovudine in vehicles ranging from 120 to 200 nanometres in size.
 4. Nanocapsules are pods that encapsulate drugs, which ensures the drugs are released more slowly and steadily in the body
 5. Nanopharmaceuticals are rapidly emerging sub-branch that deals with the drug-loaded nanocarriers or nanomaterials that have unique physicochemical properties and minute size range for penetrating the Central Nervous system
 6. Nano-pharmaceuticals can be tailored with functional modalities to achieve active targeting to the brain tissues.
 7. The magic behind their therapeutic success is the reduced amount of dose and lesser toxicity, whereby localizing the therapeutic agent to the specific site.
- **Health monitoring:**
 1. Nanotubes and nanoparticles can be used as glucose, carbon dioxide and cholesterol sensors and for in-situ monitoring of homeostasis, the process by which the body maintains metabolic equilibrium.
 2. In developing nations, the use of nanotechnology is also being explored in the fight against infectious diseases such as HIV and TB.
 3. Nanoparticles could also be the basis for delivering an aerosol TB vaccine.
 4. Needle-free, and therefore not requiring trained personnel to administer it, the vaccine is stable at room temperatures — important in rural areas that lack a reliable cold chain.
- **Vaccines:**
 1. Nanotechnology could herald a new era in immunisation by providing alternatives to injectable vaccines for diseases that affect the poor.
 2. Injectable vaccines need to be administered by healthcare professionals, who may be scarce in developing countries, particularly in rural areas.
 3. Vaccines also need reliable refrigeration along the delivery chain. Scientists are working on an aerosol TB vaccine.
 4. They are also investigating a nanotechnology-based skin patch against West Nile Virus and Chikungunya virus.
- **Tissue growth and regenerative medicine:**

1. Researches in tissue regenerative medicine aims in developing implants or scaffolds capable for delivering drugs, growth factors, hormones for tissue repair.
2. They provide sustained delivery of bioactive molecules to support survival, infiltration and proliferation of cells for tissue engineering.
3. The expected outcome of such treatment modality is to have complete tissue replacement and functional recovery.

Conclusion

Nanotechnology offers the ability to build large numbers of products that are incredibly powerful. Nanomedicines and nanodevices are in their early stages of development. The development processes are heavily intertwined with biotechnology and information technology, making its scope very wide. Nanotechnology based products are capable of overcoming the limitations of traditional methods. But, the major challenges are yet to prevail over its toxicity, environmental hazards, production cost and accessibility to the un-reachable at far-off areas.

DAILY QUIZ

Q1. What is the purpose of ‘evolved Laser Interferometer Space Antenna (eLISA)’ project?

- (a) To detect neutrinos
- (b) To detect gravitational waves**
- (c) To detect the effectiveness of missile defence system
- (d) To study the effect of solar flares on our communication systems

Q2. Consider the following pairs:

Terms sometimes seen in news	Context/Topic
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1. Belle II experiment — Artificial Intelligence
2. Blockchain technology — Digital/Cryptocurrency
3. CRISPR – Cas9 — Particle Physics

Which of the pairs given above is/are correctly matched?

- a. 1 and 3 only
- b. 2 only**
- c. 2 and 3 only
- d. 1, 2 and 3

Q3. About Bahini Scheme ?

1. The Odisha government is set to announce a scheme (Bahini) to install vending machines to provide free sanitary pads.
2. It aims at providing “100% access to free and safe sanitary pads to secondary and senior secondary school going girls The land slopes to the west from Central India.

Select the correct answer using the codes given below:

- a. 1 only
- b. Only 2**
- c. Both 1 & 1
- d. None

Q4. Which one of the following began with the Dandi March?

- a. Home Rule Movement
- b. Non-Cooperation Movement
- c. Civil Disobedience Movement**
- d. Quit India Movement

Q5. The 1929 Session of Indian National Congress is of significance in the history of the Freedom Movement because the .

- a. attainment of Self-Government was declared as the objective of the Congress
- b. attainment of Poorna Swaraj was adopted as the goal of the Congress**
- c. Non-Cooperation Movement was launched
- d. decision to participate in the Round Table Conference in London was taken