

Science and Technology Class 13

19th August, 2023 at 1:00 PM

ISSUES WITH CRYPTOCURRENCIES (01:10 PM)

- Because of its anonymous nature, cryptocurrencies can be used for illegal activities such as smuggling of drugs, terror financing, etc.
- Volatile tracks of ups and downs based on complete speculation can introduce instability in the market and economy.
- There is uncertainty over consumer protection and dispute settlement mechanism.
- Proof of work-based blockchains is not considered environmentally friendly because of high energy consumption.

PROOF OF STATE BLOCKCHAIN (01:35 PM)

- Recently, the Ethereum blockchain has shifted from proof of work to proof of state blockchain.
- In a proof-of-work system, miners compete to solve complex mathematical problems using computational power. The process consumes a lot of energy.
- In proof of state, there are no miners but validators.
- Validators are selected on the number of coins they hold and are willing to stake collaterals.
- Validators are responsible for validating transactions and adding new blocks to the blockchain.
- When they successfully complete the validation, the receiver rewards them in the form of new coins apart from getting their collateral back.
- If a job is not done honestly, then they lose their collateral also.
- This process is much more energy efficient than proof of work.

NON-FUNGIBLE TOKEN (01:54 PM)

- It emerged from the Ethereum blockchain.
- An NFT is a special type of digital asset that is unique and cannot be duplicated.
- NFTs can represent anything that is digital or physical, such as art, music, videos, games, etc.

DARK WEB (02:14 PM)

- The surface web is part of the internet that is easily accessible through search engines like Google.
- It consists of publicly available websites indexed by search engines.
- The deep web refers to the part of the internet that is not accessible through search engines.
- Often they require authentication, subscription or both.
- The dark web is part of the internet that is not indexed by search engines and can only be accessed through specialized browsers such as TOR.
- The content on Dark web is encrypted and anonymous.
- It is often used for illicit activities such as smuggling of drugs, weapons, terror financing, etc.

VIRTUAL PRIVATE NETWORK (02:30 PM)

- It is a technology that creates a secure and encrypted connection over a public network such as the Internet.
- It allows users to access and transmit data securely as if they were connected to a private network.

SATELLITE-BASED INTERNET (02:37 AM)

- Starlink of SpaceX and OneWeb among others are using satellites to provide internet access instead of traditional infrastructure such as optical fibre cables.
- These programs depend upon communication satellites placed in LEO.
- It can provide uninterrupted high-speed low latency internet anywhere on the planet such as rural areas, mountain regions, remote islands, and inside flying aeroplanes among others.
- There are **some concerns**-
- Space debris and collision risks.
- Signal interference and degradation of signals in adverse climate.
- Impact on astronomical observation.
- It can face regulatory hurdles in some countries wrt licensing and compliance.

MISSILE TECHNOLOGY (03:07 PM)

- It is a weapon system that can deliver a warhead with great accuracy and high speed.
- **Types of Missile-**
- **1) Based on the Trajectory**
- **a) Ballistic Missile**
- It follows a ballistic trajectory with the objective of delivering one or more warheads to a predetermined target.
- These missiles are guided for a brief duration just in starting phase and the rest of the path is like a freefalling projectile under gravity.
- These missiles can have a very large range relatively consuming less fuel.
- However, it can be intercepted by radars early into the flight and they are suitable for stationary targets.
- **E.g.** Agni and Prithvi missiles of India
- **b) Cruise Missile**
- It is a guided missile used against terrestrial targets that remain in the atmosphere.
- This missile flies at more or less a constant altitude with not a lot of variation in speed also.
- Their path is not guided by gravity.
- They can be highly accurate, fast and difficult to intercept by radar.
- However, because of continuous guidance, they consume more fuel.
- **E.g.** Brahmos missile of India.
- **2) Based on the launch platform and target**
- a) Surface to Surface. E.g. Agni
- b) Surface to Air. E.g. Akash
- c) Air to Air. E.g. Astra
- d) Anti-tank missile. E.g. Nag/Helina
- **3) Based on speed**
- Subsonic missile: with speed < Mach 1
- Transonic missile: with speed almost equal to Mach 1
- Supersonic missile: with speed = Mach 1 to 5
- Hypersonic missile: with speed > Mach 5
- **4) Based on the Range**
- Short-range missile: Range < 1000 km
- Mid-range missile: Range = 1000 km to 3000 km
- Intermediate-range missile: Range < 1000 km
- Long-range missile: Range > 5000 km

TOPIC OF THE NEXT CLASS- DISCUSSION ON DEFENSE TECHNOLOGY (TO CONTINUE)