

**GUIDED  
SELF STUDY  
PROGRAMME**



## **INFORMATION TECHNOLOGY**

**CAPSULE  
Part -1  
(June-November  
2019)**



**99644 32222**



**www.manifestias.com**

### LOCATION

\*No.39, 3rd Cross 1st Main, Chandra Layout, Opp.Sangeetha Mobiles, Bengaluru-560040  
\*Raghavendra Arcade, No.1582, 1st & 2nd Floor, 1st main Road, 1st Stage, Chandra Layout

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## **ICANN and NASSCOM collaboration**

### ● Why in news?

- The global ICANN and the Indian IT industry NASSCOM Internet Corporation are developing identifiers for use in the management of internet devices and infrastructures.
- Both organizations will focus first on updating IoT devices using a domain name (DNS), even if they are closed off by the manufacturer or supplier.
- This collaboration creates a structure to identify research projects jointly, especially in new technologies relating to the unique identity system of the Internet.
- The first study is to analyze the use of DNS for upgrading IoT firmware and to research how the functionality indicated could be calculated outside a laboratory environment.
- ICANN is a non-profit organization administering domain name and Internet protocol addresses (IPs) internationally, for the Assigning Names and Numbers (ICANN) Internet Association. The Department of Commerce was created in 1988.

After 1 October 2016, it has become independent from American power.

- It also ensures computers can find each other across the internet by defining specific paths and identifiers. This enables the management and methodologies of various databases of special identity elements relevant to the Internet namespaces—and thus ensures a stable and secure operation of the network.
- National Software and Services Companies Association (NASSCOM)—NASSCOM is the leading IT industry association in India.
- The NASSCOM was founded in 1988 to serve the IT and BPO industries continually. NASSCOM participants include the technology tools of Indian Co, software services, IT / BPO services. NASSCOM's role was primarily to ensure the proper implementation in the Indian software and BPO industry of service quality and the implementation of intellectual property rights.

## **WANI (Wi-Fi Access Network Interface)**

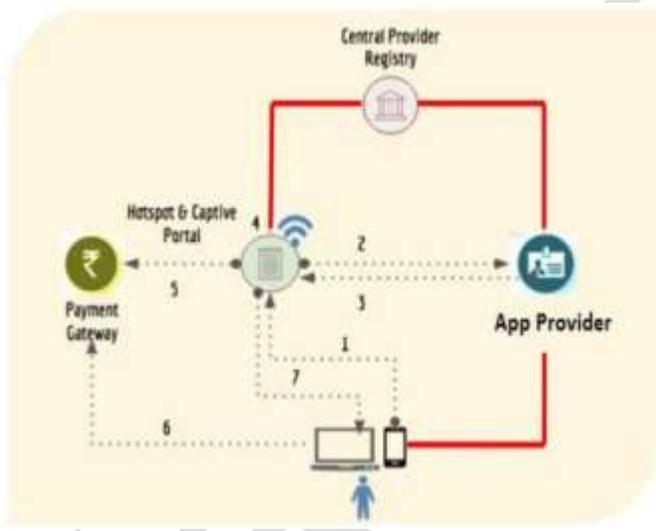
### ● Why in news?

- TRAI recently proposed the development of the Wi-Fi Access Network (WANI) architecture, capable of delineating access services from telecommunications infrastructure.
- The Plan—The cornerstone of India's New Digital Communications Strategy (2018-2022) is a single interoperable network for the provision of internet and Wi-Fi connectivity to all Indians.
- TRAI invites companies / entity leaders in the country to contribute to the development of a country-wide interoperable WiFi network, as PDOs, throughout the world.
- A partnership model will be applied to the new pilot project called Wi-Fi Access Network Interface (WANI).
- Small businessmen and shoppers can set up Wi-Fi hotspots (or PDO), acquire bandwidth, and resell bandwidth to end-users at a low price, from multiple internet service providers (ISPs).

### ● Features

- It is open for the public
- One-time KYC for users
- Easy to access and quick redressal of complaints
- Single click connection facility
- It has good features like favorites and so on

- It comes with good connection speeds
- Multiple users or multiple profiles can be added or used
- **What the WANI pilot will look to establish**
- **Easy entry of small operators:** Any entity should be able to easily deploy paid WiFi access points and open it for the public use. Entrepreneurs, small shop, and companies should be able to easily register, setup and operate a PDO with the least amount of maintenance possible.
- **One-click payments and easier connectivity:** Users should be able to easily discover WANI's WiFi hotspots (differentiated SSID), perform one-click payments and connect one or more devices
- **Cheap sachet-sized packs:** WiFi usage must be sold to users for consumption in small sachets in denominations of Rs 2 to Rs 20
- **Unbundling the last mile:** Providers including PDO providers, hardware & software providers, authentication and KYC providers will unbundle their services, allowing "multiple parties in the



(telecom) ecosystem to come together and enable large scale adoption" of WiFi.

- **Dismantle Monopoly:** TRAI said that WANI will try to establish a multi-provider, interoperable, collaborative model, to increase innovation, dismantle monopolies, and pass benefits to the end user.
- **Payment integration:** TRAI suggested that WANI could be directly integrated with all kinds of payments providers including wallets, credit/debit cards, net banking, and UPI.

### ● Who can be part of the WANI pilot?

- **Public Data Office Providers:** Small shops, bakeries, eateries, café outlets, cinema halls, museums, residential builders, are examples of Public Data Offices or PDOs. These PDOs have features of Public Call Offices (PCOs) but aggregates mobile data instead of providing cheap voice calls.
- **Public Data Office Aggregators (PDOAs)** are PDOs who aggregate WiFi hotspots, bandwidth. PDOAs can also independently operate their own WiFi hotspots and provide it to the public using either free or paid model.
- **App Providers:** Any mobile app company that can provide and manage eKYC (via mobile no. or Aadhaar) as well as digital payment providers.
- **Hotspot providers:** Any domestic or foreign company manufacturing or providing WiFi/hotspot hardware, software services. Such providers will also unbundle their service/product to make it easier for PDOs to set up WiFi hotspots.

### 3D Printed Pill

#### ● Why in news?

- The 3D printed pill is a new invention which will be able to analyze gut microbes.

#### ● What is this?

- Scientists have created an ingestible 3D printed pill that can measure intestinal bacteria in an invasive manner in the gastrointestinal system (GI).
- A 3D printer with microfluidic channel creates this biocompatible Pill.
- Different levels in the GI tract can now be investigated which was until now not possible.
- The current method is based on the use of DNA sequencing technologies for studying gut bacteria known as the microbiome (the intestinal microbiome contains common gut genomes, including bacteria, archaea, viruses and fungi).
- Pills were primarily tested on pigs and primates, showing that the intestinal lumen and its upstream microbiome can be accurately sampled in vivo.
- It can also help to diagnose and treat microbiome disorders.
- The pill will improve our understanding of the role of spatial distribution in the microbiome profile to

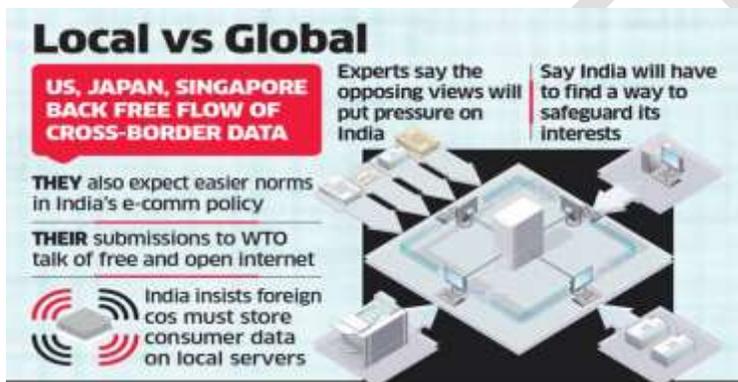
advance novel treatments and therapies for a number of diseases and conditions

- the surface of the pill is coated with a pH sensitive coating, so that it does not absorb any samples until it reaches the small intestine (where by reaction, the coating dissolves)
- There are two chambers divided by a semipermeable membrane.
- One cavity is lined with calcium, the other cavity is helical. The salt room allows the membrane to spread osmotically, which forces the bacteria into the helical channels.
- A strong magnet is also present in the tablet. The researchers can also obtain a spatial diversity of the intestinal microbiome using a magnet outside the body.
- It is unusually easy to use with the design of this device, which poses little risk and does not give so much information to the subject.

## Data localisation

### ● Why in news?

- The Govt have strongly mooted for data localization in the nation



### ● What is data localization?

- Data localization is the act of storing data on any device that is present physically within the boundaries of a particular country in which the data are produced.

### ● Why do data localization?

- Information protection, information integrity, national security, and country economic development are used in order to secure citizen's data.
- The RBI reports, Justice BN Sri Krishna's Expert Group, the e-commerce draft and the Cloud Policy

Committee's draft report talk about need for data localization in India.

- Arbitrary use for data localization by organizations which have processed the data is a prime concern.
- Machine learning (ML), artificial intelligence (AI), and IoT technology can generate huge value from data. If not used within certain constraints, it can become catastrophic.
- With the advent of cloud computing, where data may not be in hands of India, it may cause more problems.
- The data localization provides Indian technology companies with an opportunity to develop their perspective from services to products. The Indian market is also being explored by international companies and will support the development of the local ecosystem.
- More data centers can mean that India's renewable energy markets have new, power-hungry customers. This would enable data location to also boost renewable energy in India.
- An effective, long-term policy for data localization is urgently needed.
- A broad range of social, political and economic opportunities must be incorporated into the data localization roadmap.
- Develop an optimal regulatory and legislative framework for country-specific data processors and data centers.
- In order to become a regional center of data centers, India must also provide sufficient electricity, real estate and Internet infrastructure.
- The needs of India's ITeS (ITeS) and the Business Process Outsourcing (BPO) sectors that thrive in cross-border data flows need to be taken into account adequately.

### Concerns and challenges

- Many of the recommendations in the draft e-commerce strategy include the negative economic effects of data localization. There is a lack of evidence-based policy in this approach.
- Localization may contribute to the development of the data centers in India and the cloud computing industry, but this strategy is extremely myopic in the broader public policy sense.
- The compulsory position is a data protection mechanism and may be of a less value for e-commerce promotion.

- In this case, a certain segment of the Indian industry might find mandating a strict data localization system as a discriminatory trade barrier and provoke retaliation.
- In the event of data localization and its impact on start ups and MSMEs may be in the form of higher costs of hosting data.
- It would be detrimental to the global data economy if another country triggers a vicious cycle of localization needs in response to India's possible data location.
- When data cannot be aggregated globally, development will be limited.
- There is a lack of infrastructure to properly capture and manage data in India.

## 5G

### ● Why in news?

#### The technology and more

- GSMA, the national telecoms industry body, expects India, with 88 million 5G connections, to have 920 million mobile subscribers by 2025. India will thus be trailing global peers such as China, which by 2025 will see nearly 30% of its subscribers on 5G with faster connection and higher data rates.
- The term "5G" is used to describe the next generation of mobile networks beyond LTE.

#### Requirements

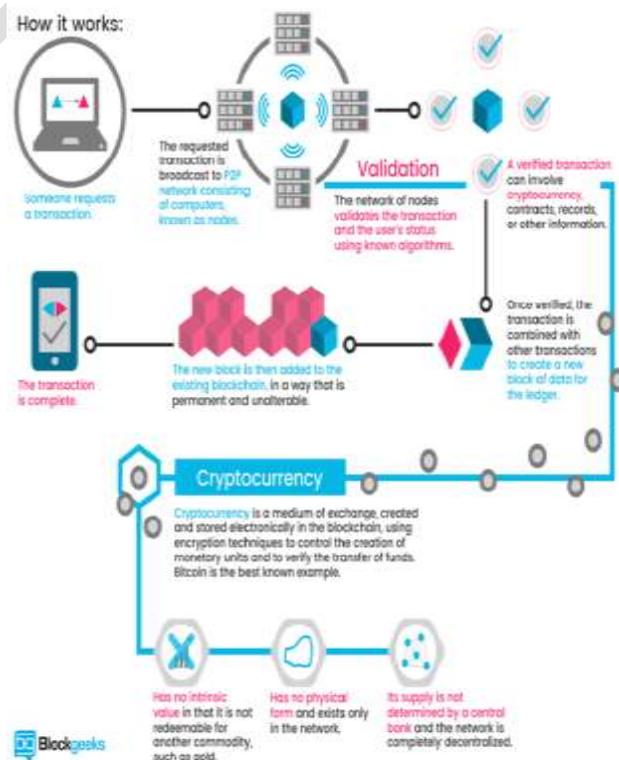
- It is a combination of wireless technologies with much higher data rates, much lower power, extended battery life and lower emissions.
- **The Internet of Things will be useful**-Not only are people connected but utility machines, industrial equipment, cars, urban infrastructure, public safety and more are also connected.
- **The hardware used**- The 5G network must rely on the LTE Advanced Pro platform in order to accommodate a wide number of devices, many of which need longer battery life.
- The initiative will use the two NB-IoT (Enhanced Network Communications) and NB-IoT (Enhanced System Technology) technology systems, which will minimize the system and network size requirements to meet these service goals. 5G network velocities will reach a peak data rate of 20 Gb / s in the downlink and 10 Gb / s for the uplink

- In a mobile scenario, latency in the 5G network can be as low as 4 milliseconds and in highly reliable communication scenarios with low latency it may not exceed 1 millisecond.

## LIBRA

### ● Why in news?

- It's the new cryptocurrency of Facebook
- **The cryptocurrency**
  - The Libra has been unveiled by Facebook, based on the Libra Blockchain, it's backed by the Libra Reserve.
  - Calibra is the digital wallet announced by the company.
  - It's available on android and apple platforms and can be used in social networks like Whatsapp and Facebook messenger.
  - The name is inspired by the origins of money in Ancient Rome, where the Libra was a unit of weight used to mint coins.
  - It is derived from the French word and the astrological symbol



## Automated Facial Recognition system (AFRS)

### ● Why in news?

- A Request for Proposal for Automated Facial Recognition System (AFRS), to be used by police across the country, has been issued by the National Crime Records Bureau (NCRB).
- AFRS functions through the management of a large database of photos and videos of the faces of the people. In order to find a match to identify the person, a new image of an unidentified person often from CCTV footage is matched with the existing database. "Neural networks" is the artificial intelligence system used for pattern recognition and matching.
- It plays an important role in crime prevention and detection.
- The verification of documents etc. may also be fast tracked.
- It's a mobile application and web-based application hosted in Delhi.
- You may use artificial intelligence to compare two pictures of an individual from different sources.
- It is said to be interlinked into several sites currently operating such as CCTNS or Khoya Paya and also Fraud and crime monitoring networks.

### ● Concerns:

- The AFRS is being contemplated at a time when **India does not have a data protection law**. In the absence of safeguards, law enforcement agencies will have a high degree of discretion. This can lead to a mission creep. The Personal Data Protection Bill 2018 is yet to come into force, and even if it does, the exceptions contemplated for state agencies are extremely wide.

## Quantum Supremacy

### ● Why in news?

- It's a new edge technology in computing

### ● What is this?

- Quantum supremacy refers to a quantum computer problem-solving process which cannot be solved in its normal life by a classic computer.
- The concept is linked to the speed of a quantum computer.

- Quantum computers vary from discrete digital electronic computers based on transistors (a semiconductor to reproduce, turn, and control electronic signals).
- For ordinary digital computing, the data must be encrypted in binary digits (bits), each in one of two definite states (0 or 1).
- Quantum Calculator uses quantum bits.
- They work according to two main quantum physics principles: overlap and interconnection.
- Overlay implies any qubit can be a '1' and a '0' simultaneously.
- Entanglement means qubits may be connected with each other in a superposition state; i.e. the position of a qubit may depend upon that of another qubit (whether it is a 1 or a 0. This means that particles are related to the other, so even when isolated by great distances, the action is achieved on one side. Albert Einstein ruled this phenomenon so much that he called it a "distant spooky motion."

## Darknet

### ● Why in news?

- Kerala police has set up a new facility to encounter problems due to the dark web

### ● Darknet

There are three layers on the darknet or the dark web:

- The first layer is mainstream, and consists of regular sites such as Facebook, Twitter and Amazon. Only 4% of the whole internet makes up this layer.
- The second level, the profound cloud, is a network where data is stored in an inaccessible database (that is, conventional search engines such as Google are not accessible). It is used to give access to a single population group. The data are usually sensitive and private (public, private, bank, cloud, etc) and are therefore not accessible.
- The third layer is the deepest, often referred to as the 'deep web.' It is a network that is encrypted over the Internet.
- It is basically a networking network usable only with special programs like Tor (The Onion Router) or I2P (Invisible Networking Project).
- Anything on the dark web will not be dragged into the web and will thus be very private.

**Concerns about Darknet**

- Out of 2,723 websites, 1,547–57%–host drugs (423 pages, illegal pornography (122) and hacking (96) amongst others, is categorized by content.
- Login details of streaming sites such as Netflix sold on the darknet markets for low prices were also reported.
- The network is also used without government censorship by several activists, including those who live under oppressive regimes.
- Activists in the Arab Spring used the TOR network.

**Darknet and India**

The ITA deals with cyber-crime and is a member of the Ministry of Electronics and IT. The law contains only six sections dealing with cybercrime.

- In times of change, India needs an internet crime code that falls under the Ministry of Home Affairs which would also cover police issues.
- There is a need for police force which is trained in cybercrime not to be transferred to maintain knowledge standards to deal with such activities.

**Big data for disaster Management****● Why in news?**

- UN Asia Pacific social agency has said that big data can be used to mitigate disasters

**● How does this work?**

- There are four primary disaster management processes such as stopping, planning, coping and recovering.
- A network of Big Data sensors can help to alleviate disasters by focusing on computer simulations for flooding and cyclone prediction and by forecasting the location and severity of floods. Machine learning can help.
- Early warning systems can be powerful across sensor networks and through the Internet of Things.
- Satellite and drone Remote sensing provides rapid damage assessments and affected individuals to prioritize disaster response.
- Public data such as Indian Digital ID (Aadhar) will enable millions of small and marginal farmers impacted by droughts to gain targeted benefits.
- Big data systems have resulted in significant mortality declines and economic loss in northern and eastern Asian typhoons.

**● What is big data?**

- Big data is largely distinguished from data sets so large that traditional data storage and processing methods cannot be stored and analyzed.
- It has three features, known as volume, speed and versatility, which differentiate Big Data from other forms.
- In particular, the development of Big Data was due to a reduction in sensory and mass digitization costs of systems and processes world-wide.

**Edge computing****● Why in news?**

- By 2025, businesses can generate and store more than 75% of their data outside the conventional consolidated data centers, which are at the edge of the cloud. As the use of IoT systems grows and the need for IOT data to be processed rapidly increases, many IT administrators are exploring or are starting to use the most sophisticated computing technologies.

**What is it?**

- Edge computing allows data at the edge of a network to be analyzed, processed and transmitted.
- It is intended, in real-time without latency, to analyze data locally, closer to where it is stored, and to send them to a center.
- Edge computing facilitates fast data processing and content distribution, whether you download a video or access a library of video games in the cloud.

**How does edge computation vary from cloud calculation?**

- The fundamental difference in the way data processing takes place between edge computing and cloud computing.
- Currently, the existing IoT systems are using data centers to perform all their cloud calculations.
- On the other hand, edge computing effectively manages the huge amount of data generated at IoT devices by local storage and processing of data.
- Data need not be sent over a network as soon as it is processed. Consequently, only important data are sent and the edge computing network reduces the number of data traveling through the network.
- Experts believe that when 5 G networks are mainstream in a year, the true potential of the edge computers is evident.

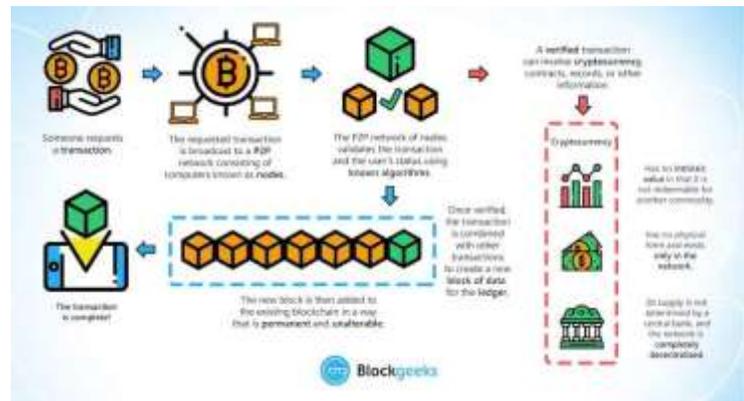
- Without even knowing it, apps can have continuous access.
- Nvidia has just unveiled the EGX edge computing platform, one of the biggest players in design and production of graphics and AI Acceleration hardware.
- This helps telecommunications operators to adopt 5 G networks that support cuttings.

## Smominru Malware

### ● Why in news?

- This malware is another growing concern
- **What are its whereabouts**
- This affects about 4,700 computers every day and in August 2019 this affected over 90,000 computers worldwide.
- The botnet depends on over 20 servers, mostly in the U.S. but some are based in Malaysia and Bulgaria.
- In its post-infection phase, a Trojan module and a cryptominer are being stolen, and propagated within the network.
- The ransomware seems to be capable of returning to the old victims if they do not thoroughly address the issue. After Smominru was removed, approximately one-fourth of the affected machines were again infected.
- The victims range from academics to medical professionals which indicate the hackers do not rely too much on their targets.
- On Windows 7 and Windows Server 2008 systems, approximately 85 percent of infections occurred.
- The target appears secretly to use infected computers at victim's expense for cryptocurrency mining.
- The most threats have happened in Beijing, Taiwan, Russia, Brazil and the USA.
- It has different kinds of worms, viruses and the short-form of malicious software designed to affect any type of computer through a software.

## Blockchain technology



### ● Why in news?

- Coffee Board is making use of blockchain

### ● What is this technology?

- Blockchains are a stable, cryptographic and network dependent new data system. The platform facilitates the transfer of data and digital assets through cryptocurrencies like Bitcoin.
- It is used in technology such as Bitcoin and others that enable commodities to be exchanged with a central ledger after authentication.
- A less creative world in which e-mails, the World Wide Web, Napster, Skype and Uber have been developed is the new evolutionary blockchain network, like the early Internet.

### How does it work?

- The technology allows transparent and safe, peer-to-peer transfers, fast and free of friction. It does this by transferring confidence to a vast global network from influential intermediaries, which allows a tamper-resistant public archive of any transactions ever made on the network, through mass coordination, clever coding and cryptography.
- A block is the actual part of a ledger that tracks any or all recent transactions and joins the blockchain as a permanent archive once the transaction has been completed. A new block is generated every time a block is completed. Blocks are in a linear, chronological order with each block containing the previous block hash, like a chain.

### ● Benefits

- It's like a public recording of all transactions.
- The transfers are done through mining that makes hacking difficult. All transactions carried out are authorized by miners, making the transactions unchanged and preventing the hacking threat.

- Rejects third party use and other errors.
- This encourages infrastructure to be autonomous.

## Project Soli

### ● Why in news?

- Google Pixel 4 is launching Motion Sense, a feature with a radar-based Soli sensor, which provides similar touch-sensitive controls.

### ● What's fresh about this technology?

- Google's Soli is a purposeful chip for microscopically tracking your movement.
- This uses miniature radar to detect human hand movement in real time; it can track submillimeter motion with great accuracy at high speeds.

### Features

- The Soli chip is only 8 mm x 10 mm and included in one unit is a sensor and antenna array, ensuring that even the smallest wearables are ideal for use.
- There are no moveable elements, it uses very little electricity, does not suffer from lighting conditions and works with most materials to make it an innovative piece of technology.

### How does Soli chip work for Google?

- The Google Soli chip uses radar so that electromagnetic waves can be emitted with objects inside the radar which reflect data back into the antenna.
- The system collects information about the communicating effects from the reflected signal—things like time delay or frequency shifts.

## Pegasus

### ● Why in news?

- WhatsApp recently filed a lawsuit in the U.S court against Israel's NSO Group, alleging that the firm was incorporating cyber-attacks on the application by infecting mobile devices with malicious software.

### ● More information

- Members spread across at least 20 countries in Africa, Asia, Europe, the Middle East, and North America were affected by the spyware that came from Israel.
- Targeted users in India included journalists, human rights activists, political dissidents, lawyers, and diplomats.

- The spyware named 'Pegasus' was developed by the Israeli cyber arms firm NSO in 2016.
- Usually these kinds of technology use effective installation or any download by this spyware could penetrate into the user's phone just by a Video call through Whatsapp.
- Even if the call is unanswered, it enters the phone and begins to spy.
- Spy in a way that it gets access to literally everything on the user's phone like call records, images, texts and so on.
- It can also turn the phone into a spying device by switching on its camera or microphone.

**Experience A Quantum Leap**  
With Manifest IAS in Planning of Preparation, Quality of Questions and Testing Methodologies.

**COURSE HIGHLIGHTS**

- 30 Tests (4 Basic NCERT + 10 Sectional + 4 Subject wise + 4 Comprehensive Tests + ICSAT)
- 6 Months of Comprehensive Preparation.
- Week wise Schedule
- A detailed list of subtopics static and current integration
- Online test portal with subtopic analysis
- Data analytic trends focusing on candidates knowledge, elimination and random choice
- Sunday Test and Tuesday Discussion for higher productivity
- Both Online and Offline mode available (shift as per need for each test)

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