

GOVERNANCE**Narco and Polygraph Test**

- Recently, the Uttar Pradesh government decided to conduct polygraph and narcoanalysis tests of the accused and all involved police personnel as part of the investigation into the alleged gangrape and murder of a 19-year old in Hathras last month.

Key Points

- **Polygraph or Lie Detector Test:** It is a procedure that measures and records several physiological indicators such as blood pressure, pulse, respiration, and skin conductivity while a person is asked and answers a series of questions.
- This test is based on the assumption that physiological responses that are triggered when a person is lying are different from what they would be otherwise.
- A numerical value is assigned to each response to conclude whether the person is telling the truth, is deceiving, or is uncertain.
- A test similar to Polygraph was first done in the 19th century by the Italian criminologist Cesare Lombroso, who used a machine to measure changes in the blood pressure of criminal suspects during interrogation.
- **Narcoanalysis Test:** It involves the injection of a drug, sodium pentothal, which induces a hypnotic or sedated state in which the subject's imagination is neutralized, and they are expected to divulge information that is true.
- The drug, also referred to as truth serum, was used in larger doses as anesthesia during surgery, and is said to have been used during World War II for intelligence operations.
- Recently, investigating agencies have sought to employ these tests in the investigation, and are sometimes seen as being a softer alternative to torture or "third degree" to extract the truth from suspects.
- **Brain Mapping Test or P-300 test:** In this test, the activity of the brain of a suspect is measured during interrogation to find out whether he is concealing any information.

Limitations:

- None of these methods has been proven scientifically to have a 100% success rate, and remain contentious in the medical field as well.
- The consequences of such tests on individuals from weaker sections of society who are unaware of their fundamental rights and unable to afford legal advice can be adverse.
- It may involve future abuse, harassment, and surveillance, even leakage of the video material to the Press for a trial by the media.

Legal and Constitutional Aspects:

- In the *Selvi vs State of Karnataka & Anr* case (2010), the Supreme Court ruled that no lie detector tests should be administered without the consent of the accused.
- Also, those who volunteer must have access to a lawyer and have the physical, emotional, and legal implications of the test explained to them by police and the lawyer.
- The results of the tests cannot be considered to be "confessions", but any information or material subsequently discovered with the help of such a voluntarily-taken test can be admitted as evidence
- The SC cited Article 20 (3) or Right against self-incrimination which states that no accused can be compelled to be a witness against himself.
- In the *D.K. Basu vs. State of West Bengal* case, 1997, the SC ruled that involuntary administration of the polygraph and narcos test will amount to cruel, inhuman, and degrading treatment in the context of Article 21 or the Right to Life and Liberty.
- It may also be violative of the Right to Privacy which is a part of the Right to Life.
- The Indian Evidence Act, 1871 does not admit the results of these tests as evidence.
- The National Human Rights Commission in 1999 adopted a set of guidelines relating to the administration of the Polygraph Test which included consent, recording of the test, etc.

Way Forward

These methods cannot be used as incriminating evidence or confessions due to their limited reliability and scientific proofs. However, they can be used as useful tools to solve complicated cases as investigative tools. The government should encourage the use of scientific techniques in the otherwise long investigative procedures and trials but should also come up with strict rules for their use in a decent, and consensual manner.

SCIENCE AND TECHNOLOGY**Shaurya Missile**

Recently, a successful trial of the nuclear-capable Shaurya missile was conducted by India.

- Also, Brahmos land attack cruise missile was tested a few days before this testing.

Key Points**Shaurya Missile:**

- Shaurya is a land variant of short-range Submarine Launched Ballistic Missile (SLBM) K-15 Sagarika, which has a range of at least 750 kilometers.
- It is capable of carrying payloads of 200 kg to 1000 kg.
- It is a surface-to-surface tactical missile.
- These ballistic missiles belong to the K missile family - codenamed after late Dr. APJ Abdul Kalam - which are launched from Arihant class of nuclear submarines.
- Shaurya, like many of the modern missiles, is a canister-based system, which means that it is stored and operated from specially designed compartments.
- The missile is less vulnerable to anti-ballistic missile defence systems due to its high maneuverability.

The K Family of Missiles:

- The K family of missiles are primarily Submarine Launched Ballistic Missiles (SLBMs).
- These have been indigenously developed by Defence Research and Development Organisation (DRDO).
- The development of these missiles began in the late 1990s as a step towards completing India's nuclear triad.
- Nuclear triad is the capability of launching nuclear weapons from land, sea and air-based assets.
- Because these missiles are to be launched from submarines, they are lighter, smaller and stealthier than their land-based counterparts - the Agni series of missiles which are medium and intercontinental range nuclear capable ballistic missiles.
- India has also developed and successfully tested multiple times the K-4 missiles from the family which has a range of 3500 km.
- The early development trials of K-15 and K-4 missiles had begun in the early 2010s.
- K-5 and K-6 with ranges of 5000 and 6000 km are also under development.

Strategic Importance of SLBMs:

- Nuclear Deterrence: The capability of SLBMs has great strategic importance in the context of achieving a nuclear triad, especially in the light of the 'no first use' policy of India which acts as a deterrent.
- These submarines can not only survive a first strike by the adversary but also can launch a strike in retaliation thus achieving Credible Nuclear Deterrence.
- The development of these capabilities is important in light of India's relations with the two neighbours China and Pakistan.

Ballistic Missile

- It is a rocket-propelled self-guided strategic-weapons system that follows a parabolic trajectory to deliver a payload from its launch site to a predetermined fixed target.
- Ballistic missiles can carry conventional high explosives as well as chemical, biological, or nuclear munitions.

Ballistic Missile Defence System in India

- A Ballistic Missile Defence system (BMD) is a missile defence system that acts as a shield against ballistic missile attacks.
- India's BMD development began in 1999, after the Kargil war.
- The primary aim was to augment India's defence against possible nuclear attack from Pakistan.
- India seeks to deploy a functional 'iron dome' ballistic missile defence (BMD), incorporating both low-altitude and high-altitude interceptor missiles.
- India's BMD is primarily developed by DRDO with help of many public and private firms like BEL, Astra Microwave, L&T, etc.
- Ballistic missiles of India: Agni, K-4 (SLBM), Prahaar, Dhanush, Prithvi and Trishul.

ENVIRONMENT AND DIVERSITY**Inadequate Compensatory Afforestation**

According to a recent study on compensatory afforestation in lieu of forest diversion for development of projects in Himachal Pradesh's Kinnaur district, only 10% of saplings said to be planted were actually found on the site and their survival rate was as low as 3.6%.

- The study has been carried out by Himdhara Environment Research and Action Collective. It is based on government data and ground research and was conducted between 2012 and 2016.

Key Points

Data Analysis:

- As of 31st March 2014, the total area demarcated for compensatory afforestation was 1,930 ha in lieu of 984 ha of forest land diverted for non-forest activities, including roads, hydro-projects, transmission lines, etc.
- The total diverted forest land in Kinnaur had 11,598 standing trees, belonging to 21 species.
- The majority of the trees felled were coniferous, dominated by cedar (3,612 felled) and near-threatened chilgoza pines (2,743).
- Between 2002 and 2014, of the Rs.162.82 crore collected under Catchment Area Treatment (CAT) plan funds of Kinnaur's projects, only 36% had been spent till 31st March 2014.
- CAT plan funds are budgeted as mitigation measures for hydroelectric power projects.
- More than 90% of the diversion of forest in Kinnaur takes place for the development of hydropower projects and transmission lines.
- Himachal Pradesh has the highest installed capacity of hydropower projects of 10,000 MW in the country and located in Sutlej basin, Kinnaur is the state's hydropower hub with 53 planned hydropower projects.

Compensatory Afforestation:

- According to Compensatory Afforestation Management and Planning Authority (CAMPA) rules, for every hectare of forest land diverted, double the area of 'degraded' lands are used as sites for 'compensatory afforestation'.
- Every time forest land is diverted for non-forest purposes such as mining or industry, the user agency pays for planting forests over an equal area of non-forest land, or when such land is not available, twice the area of degraded forest land.
- As per the rules, 90% of the Compensatory Afforestation Fund (CAF) money is to be given to the states while 10% is to be retained by the Centre.
- The funds are used for CAT, assisted natural generation, forest management, wildlife protection and management, relocation of villages from protected areas, managing human-wildlife conflicts, training and awareness generation, supply of wood saving devices and allied activities.

Associated Challenges:

- One of the reasons why the forest department is unable to fulfil the target is because there's simply no land available for the compensatory afforestation.
- A large part of Kinnaur is rocky and a cold desert where nothing grows.
- Around 10% of the district is already forested and the rest is either used for agriculture or are grasslands.
- Many of the plots carved out for afforestation are actually grasslands which are used by the villagers for grazing cattle.
- In many instances, the villagers uproot the saplings because they do not want the grassland converted to a forest.
- This lack of land for afforestation means that once a forest has been felled, it is often lost permanently.
- The authorities only look at identifying plots of land where afforestation can take place just because it is mandated which makes the concept faulty.
- Socio-economic needs are not considered and there is also no monitoring of the afforestation as well.

Compensatory Afforestation Fund Management and Planning Authority

- It works as a national advisory council under the chairmanship of the Union Minister of Environment, Forest and Climate Change for monitoring, technical assistance and evaluation of compensatory afforestation activities.
- Objectives of CAMPA: To promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses.

Way Forward

- Rapidly running out of space for compensatory afforestation, the Forest Department should carry out plantations in other districts in lieu of forest land diverted in Kinnaur.
- There is a need to understand the adverse effects of deforestation and address it in a timely manner with adequate resources and sufficient monitoring and guidance. The state should

encourage people's participation allowing more connections between the people and the forests leading to better care and protection of the new saplings and the existing trees.

INDIAN AGRICULTURE

Xoo Infection:Rice

Recently, scientists from the Centre for Plant Molecular Biology (CPMB) have uncovered the mechanism by which a bacterium called Xoo interacts with rice plants and causes disease.

Key Points

About:

- *Xanthomonas oryzae* pv. *oryzae* (Xoo) causes a serious bacterial leaf blight disease in rice. It is also known as Bacterial blight.
- Xoo is a gram-negative bacteria.

Transmission:

- Xoo infection causes huge yield losses to rice cultivation throughout the world.
- Xoo infection initiates from the leaf sheath and eventually spreads to mature leaves through the water flow under optimum temperature and high humidity conditions (Vascular disease).
- Since rice paddies are flooded throughout most of the growing season, Xoo may easily spread among crops; bacteria travel through the water from infected plants to the roots and leaves of neighbouring rice plants.
- Wind may also help spread the Xoo bacteria to other crops and rice paddies.

Impact on Other Crops:

- In addition to rice, Xoo may infect other plants, such as rice cut-grass (*Leersia oryzoides*), Chinese sprangletop (*Leptochloa chinensis*), and common grasses and weeds.

Prevention:

- The most-common method of defending against rice bacterial blight is the cultivation of rice varieties with genes that confer resistance to Xoo infection.
- Over 30 resistance genes, termed Xa1 to Xa33, have been identified in rice plants, and some, such as Xa21, have been integrated into the genomes of commercial rice strains.
- However, this method involves breeding or gene manipulation techniques that are laborious and time-consuming.
- Also, the introduced resistance genes provide only race-specific resistance that will prevent infections by only specific strains of Xoo.

New Approach:

- Scientists from Centre for Plant Molecular Biology (CPMB), Osmania University, Hyderabad are working to identify and develop few molecules which are derived either from the Xoo bacterium or from the infected rice cell walls.
- Treatment of rice with cellulase, a cell wall degrading enzyme secreted by Xoo induces rice immune responses and protects rice from subsequent infections by Xoo.
- The cellulase protein has the features of a typical vaccine as it is a potent elicitor of rice immune responses.

Rice

Kharif Crop

- Temperature: **Between 22-32°C with high humidity.**
- Rainfall: **Around 150-300 cm.**
- Soil Type: **Deep clayey and loamy soil.**
- Some of the most important rice-growing regions are Assam, West Bengal, coastal regions of Odisha, Andhra Pradesh, Telangana, Tamil Nadu, Kerala and Maharashtra, particularly the (Konkan coast) along with Uttar Pradesh and Bihar.
- Development of a dense network of canal irrigation and tubewells have made it possible to grow rice in areas of less rainfall such as Punjab, Haryana and western Uttar Pradesh and parts of Rajasthan.
- In states like Assam, West Bengal and Odisha, three crops of paddy are grown in a year. These are Aus, Aman and Boro.
- National Food Security Mission, Hybrid Rice Seed Production and Rashtriya Krishi Vikas Yojana are few government initiatives to support rice cultivation.
- Diseases in rice are mainly caused by bacteria, viruses, or fungi. Few major diseases are:
- Sheath blight: Caused by fungus *Rhizoctonia solani*.
- Brown Spot: One of the most common and most damaging fungal diseases.
- Tungro: Caused by the combination of two viruses, which are transmitted by leafhoppers.

- Bakanae: Seedborne fungal disease.
- Blast (node and neck): Caused by the fungus Magnaporthe oryzae.

Gram-negative Bacteria

- Bacteria can be classified into two groups on the basis of the differences in the cell envelopes and the manner in which they respond to the staining procedure developed by the Danish bacteriologist Gram viz., those that take up the gram stain are Gram positive and the others that do not are called Gram negative bacteria.
- Gram-negative bacteria cause infections including pneumonia, bloodstream infections, wound or surgical site infections, and meningitis in healthcare settings.
- Gram-negative bacteria are resistant to multiple drugs and are increasingly resistant to most available antibiotics. These bacteria have built-in abilities to find new ways to be resistant and can pass along genetic materials that allow other bacteria to become drug-resistant as well.
- Gram-negative infections include those caused by Klebsiella, Acinetobacter, Pseudomonas aeruginosa, and E. coli., as well as many other less common bacteria.

Centre for Plant Molecular Biology

- CPMB is one of the 7 Centers of Excellence created in the country with initial financial assistance from the Department of Biotechnology, Government of India.
- Currently it is one of the leading Centers of the country in Plant Molecular Biology (study of molecular basis of plant life).

INTERNATIONAL AFFAIRS

Referendum in New Caledonia

The French territory of New Caledonia voted against independence from France in a referendum held recently.

The referendum was a part of a decolonisation plan agreed in 1998, known as the Noumea Accord.

Key Points

About: New Caledonia is an archipelago and special collectivity of France located in the southwest Pacific Ocean.

Population: The indigenous Kanaks represent around 39% of the population, while European settlers (known as Caldoches) make up about 27%.

Most of the remainder are from other Pacific islands, which are of mixed heritage, called Caledonians.

History:

- New Caledonia was discovered in 1774 by the British navigator James Cook.
- It was annexed by France in 1853.
- In 1946, New Caledonia became an overseas territory.
- By 1953, French citizenship had been granted to all New Caledonians, regardless of ethnicity.

Economy: Besides having one of the region's highest average incomes per capita, New Caledonia is rich in resources and accounts for around 10% of the world's nickel reserve.

Political Status: New Caledonia is a territory sui generis i.e. territory of its own kind.

- It is a French overseas collectivity i.e. they are first-order administrative divisions of France but have a semi-autonomous status.
- It is one of the United Nations 17 Non-Self-Governing territories - where the process of decolonisation has not been completed.
- Non-Self-Governing Territories are defined as "territories whose people have not yet attained a full measure of self-government". It includes the Cayman Islands, British Virgin Islands, Bermuda, Western Sahara, etc.
- They vote in French elections and have French nationality.
- New Caledonia has a power-sharing executive elected by the territory's Congress, which ensures that all parties on it are represented in proportion to their number of seats in Congress.
- It depends on France for matters like defence and education.

Conflict Over Independence: The country has had conflicts over the issue of autonomy and independence from France for a long time.

- New Caledonia has deep divisions between its indigenous Kanak population and Europeans, with indigenous Kanaks favouring independence and Europeans being against it.
- In the 1980s, the country had violent conflicts between the opponents and supporters of independence which culminated into Matignon Accords in 1988.
- The Accords specified a 10-year transitory status, after which a self-determination referendum would be held.

- The Noumea Accord, which was concluded in 1998, provided for a practically sovereign status. Under this agreement, New Caledonia is allowed up to three referendums on independence, the latest one being the last of them.

Significance:

At a time where Chinese influence on the island, and in the whole South Pacific region is growing, it is very significant for France to be able to retain control over the island.

A significant portion of New Caledonia's exports goes to China, much of which is nickel.

Though India has no official position of the referendum, the results of this referendum are particularly important for India in the double context of growing India-France relations and Indo-China conflicts. France is urging Australia and India to form a new "strategic axis" in the Indo-Pacific with it and New Caledonia to counter China's rise.

IMPORTANT FACTS FOR PRELIM**17th Annual Science and Technology in Society Forum**

India participated at the Science & Technology Ministerial Roundtable, organized in the 17th annual Science and Technology in Society (STS) Forum.

Key Points

- Science & Technology Ministerial Roundtable:
- Hosted by: **Japan**
- Science and Technology Ministers' Roundtable is held along with the STS forum every year.

Major highlights:

- Deliberated on the role of international R&D collaboration,
- Social sciences & humanities,
- Open science.
- Participation: S&T heads from about 50 countries around the world participated and explored the opportunities arising from international collaborations at the Roundtable to address the challenges posed by Covid 19.
- India highlighted initiatives by India regarding sharing of scientific data- National Data Sharing and Accessibility Policy and an open government data portal.

Science and Technology in Society (STS) Forum

- The Science and Technology in Society (STS) forum was inaugurated in 2004.
- The STS forum aims:
- To provide a new mechanism for open discussions on an informal basis.
- To build a human network that would timely resolve the new types of problems stemming from the application of science and technology.
- It holds an annual meeting starting on the first Sunday of October every year, in Kyoto, Japan.

India's Role in Global S&T Fraternity

- Scientific data sharing with partner nations is being considered for inclusion in the Science Technology and Innovation Policy (STIP 2020) being framed.
- International Cooperation: India gives extraordinary importance to international cooperation in S&T for development and for addressing challenges of health, water, energy, environment, climate change, communication, and natural disasters. Example:
- India's active S&T participation in international mega-science projects such as International Thermonuclear Experimental Reactor ITER, Thirty Metre Telescope (TMT).

Mission Innovation:

- Mission Innovation (MI) was announced in 2015 due to pioneering efforts by India, France, and the USA to combat climate changes.
- MI is a global initiative of 24 countries and the European Union to dramatically accelerate global clean energy innovation.
- As part of the initiative, participating countries have committed to double their governments' clean energy Research and Development (R&D) investments over five years.
- Encouraging private sector investment in transformative clean energy technologies.
- The Innovation Challenges cover the entire spectrum of RD&D; from early-stage research needs assessments to technology demonstration projects.

India's Global Initiatives:

- Coalitions for Disaster Resilient Infrastructure (CDRI) - An international knowledge platform where countries can collaborate to make their existing and new infrastructure strong enough to withstand natural disasters.

- International Solar Alliance - An Indian initiative that was launched in 2015 in Paris, France with the objective to collectively address key common challenges to the scaling up of solar energy in ISA member countries.
- For Covid-19: Vaccines for coronavirus are in advanced phases of trial, and India has the capacity to supply the vaccine to a major part of humanity.
- This is in addition to other medicine requirements that global pharmacy(India) has provided during the pandemic.

National Data Sharing and Accessibility Policy

- The NDSA was adopted in 2012.
- It was a step towards making non-sensitive government data accessible online.
- The main thrust of the policy is to “promote data sharing and enable access to Government of India owned data for national planning, development and awareness”.
- The implementation guidelines for NDSAP included ideals such as “openness, flexibility, transparency, quality” of data.
- It aims to facilitate “access to Government of India shareable data in machine-readable form”.
- The guidelines prescribe open digital formats suitable for analysis and dissemination.
- Open Government Data Portal: As part of the Open Government Data (OGD) initiative, data.gov.in was launched in 2012.

DAILY ANSWER WRITING PRACTICE

Qns.What do you understand by Corporate Governance ?Why is it important for the success and sustainability of an organization.(150 words)

Ans.

Corporate governance is defined as a set of systems, processes and principles which ensure that a company is governed in the best interest of all stakeholders. It is about promoting corporate fairness, transparency and accountability.

- Corporate governance plays an important role to protect the rights of thousands of shareholders, who have ownership in the company but do not play an active role in governing day to day business activities. It includes both social and institutional aspects.

Corporate governance components:

- Open to public Information disclosure, high transparency and accountability are basic important elements of best corporate governance that strives the sustainability of corporations and society.
- To avoid mismanagement, good corporate governance is necessary to enable companies to operate more efficiently, to improve access to capital, mitigate risk and safeguard stakeholders.

Importance of corporate governance:

- Importance of Social Responsibility: Social responsibility is given a lot of importance in the present time. The corporates have to protect the rights of the customers, employees, shareholders, suppliers, local communities, etc. This is possible only if they use corporate governance.
- Growing Number of Scams: In recent years, many scams, frauds and corrupt practices have taken place. Misuse and misappropriation of public money are happening everyday in India and worldwide.
- It is happening in the stock market, banks, financial institutions, companies and government offices. In order to avoid these scams and financial irregularities, many companies need to adopt corporate governance.
- Globalization: Today most big companies are selling their goods in the global market. So, they have to attract foreign investors and foreign customers. They also have to follow foreign rules and regulations.
- All this requires corporate governance. Without Corporate governance, it is impossible to enter, survive and succeed in the global market.
- Protect the interest of all stakeholders: Today, there are many takeovers and mergers in the business world. Corporate governance is required to protect the interest of all the parties during takeovers and mergers.
- The adoption of Corporate governance principles can also play a role in increasing the corporate and business value of companies and help in growth of the national economy.
- A lack of corporate governance can lead to profit loss, corruption and a tarnished image, not only to the corporation, but to the society, or even worse will influence global as a whole.

Suggestions to improve corporate governance in India

- Implement the recommendations of Uday Kotak Panel, such as:

- Minimum 6 directors to be on board of listed entities; every listed entity to have at least 1 independent woman director
- More transparency on appointment of independent directors and should play a more active role on the boards.
- Diverse boards are better boards: In this context, ‘diverse’ is all-encompassing, including gender, ethnicity, skills and experience.
- Robust risk management policies: Adoption of effective and robust risk management policies for better decision making as it develops a deeper insight into the risk-reward trade-offs that all Corporations face.
- Effective governance infrastructure: Policies and procedures which guide ethical behaviour should form the base of any organizational behaviour. Ensure separation of the line of responsibility between board and management.

Conclusion

- The primary objective of a corporation is to increase its brand value in the market i.e. society. Successful corporations must operate within the society; to that end, they must maintain the values and norms of the society in which they operate.
- In Indian corporate policies like protecting small shareholders, preventing frauds and malpractices and promoting corporate social responsibility are some of the examples of good corporate governance.

DAILY QUIZ

1. With reference to Data Governance Quality Index (DGQI) survey, consider the following statements:
 1. It was conducted by the Ministry of Rural Development.
 2. It aims to assess performance of the implementation of Central Sector Schemes (CS) and Centrally Sponsored Schemes (CSS).
 Which of the statements given above is/are correct?

a) 1 only	b) 2 only
c) Both 1 and 2	d) Neither 1 nor 2
2. Consider the following statements regarding Atal Tunnel:
 1. It connects Manali to Lahaul and Spiti in Himachal Pradesh.
 2. It is the longest highway tunnel in the world.
 3. The tunnel is built in the Dhauladhar range of Himalayas.
 Which of the statements given above is/are correct?

a) 1 and 2 only	b) 2 and 3 only
c) 1 and 3 only	d) 1, 2 and 3
3. ‘Exercise Bongosagar’, a bilateral naval exercise is conducted between which of the following two countries?

a) India and Bangladesh
b) India and Maldives
c) Bangladesh and Srilanka
d) Maldives and Srilanka
4. Consider the following statements:
 1. Mahatma Gandhi participated in the Third Round Table Conference only.
 2. The Hindustani Prachar Sabha was founded by Mahatma Gandhi at Wardha in 1942.
 Which of the following statements is/are correct?

a) 1 only	b) 2 only
c) Both 1 and 2	d) Neither 1 nor 2
5. With reference to Retributive Justice, consider the following statements:
 1. It is a system of criminal justice based on the punishment of offenders as well as their rehabilitation.
 2. It requires that the response to a crime must be proportional to the committed offence.
 Which of the statements given above is/are not correct?

a) 1 only	b) 2 only
c) Both 1 and 2	d) Neither 1 nor 2