## SCIENCE AND TECHNOLOGY

### STANDARD FOR ARTIFICIAL INTELLIGENCE (AI) ETHICS

**CONTEXT :** UNESCO's global agreement on the ethics of AI can guide governments and companies alike.

**What is Artificial Intelligence (AI)?**

- It is the science and engineering of making intelligent machines, especially intelligent computer programs.
- The historical evolution of Artificial Intelligence (AI) dates back to the year 1996 when Deep Blue AI defeated the then world chess champion.
- It is a machine which mimics the human brain for learning and accomplishes different tasks that would have historically required human intelligence.
- Different technologies like machine learning, pattern recognition, big data, neural networks, self algorithms etc are included in it.
- It assists machines in completing complicated and sophisticated jobs.
- Machine learning is frequently used as the AI's primary method.

**Applications**

- **Derives meaningful information :** AI technology enables computers and systems to derive meaningful information from digital images, videos and other visual inputs, and based on those inputs, it can take action.
- **Automated stock trading:** Designed to optimise stock portfolios, AI-driven high-frequency trading platforms make thousands or even millions of trades per day without human intervention.
- **Online shopping and advertising:** It is widely used to provide personalised **recommendations** to people, based for example on their previous searches and purchases or other online behaviour.
- **Cybersecurity**: AI systems can help recognise and fight cyberattacks and other cyber threats based on the continuous input of data, recognising patterns and backtracking the attacks.
- **Fighting disinformation: Certain AI applications can detect fake new**s and disinformation by mining social media information, looking for words that are sensational or alarming and identifying which online sources are deemed authoritative.
- **Transport**: AI could improve the safety, speed and efficiency of rail traffic by minimising wheel friction, maximising speed and enabling autonomous driving. Tesla Cars use AI.
- **Agriculture**: AI applications in agriculture have developed applications and tools which help farmers inaccurate and controlled farming by providing them proper guidance to farmers about water management, crop rotation, timely harvesting, type of crop to be grown, optimum planting, pest control etc. use of drone to analyse the captured images and provide a detailed report containing the current health of the farm.
- **Health**: It can be used for diagnostic purposes for various diseases, including COVID-19, and could prove very effective in remote areas where adequate health facilities are not available.
    - AI algorithms can also be partially credited for the rapidity with which vaccines were developed to tackle COVID-19.

**Challenges**

- **Creating New Inequalities:** Without clear policies on reskilling workers, the promise of new opportunities will in fact create serious new inequalities.
    - Widens Gap between the developing and the developed countries
- **Privacy Issues:** AI uses digital footprints and feeds them in their algorithm to exploit commercially without our consent.
- **Displacement and loss of jobs of lower strata:** Robotics and AI companies are building intelligent machines that perform tasks typically carried out by low-income workers: self-service kiosks to replace cashiers, fruit-picking robots to replace field workers, etc.
- There are problems emerging in **facial recognition technologies,** which are used to access our phones, bank accounts and apartments, and are increasingly employed by law-enforcement authorities, in identifying women and darker-skinned people.
- **Environmental Impact of Coolants used in Data Centres:** The environmental impact caused by data centres doesn't stop at electrical consumption

**India's Efforts**

- The **National Strategy on Artificial Intelligence** released by **NITI Aayog in 2018** highlights the **massive potential of AI in solving complex social challenges** faced by Indian citizens across areas such as agriculture, health, and education, in addition to the significant economic returns that AI-related technologies are already creating.



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Ph.: 8984111101, 8093083555. Web: www.vanikias.com, E-mail: vaniksias@gmail.com

- India has made great strides in the development of responsible and ethical AI governance, starting with NITI Aayog's #AIForAll campaign to the many corporate strategies that have been adopted to ensure that AI is developed with common, humanistic values at its core.

- **US India Artificial Intelligence (USIAI) initiative**
  - It has been launched to scale up the science and technology relationship between India and the United States.

**UNESCO's Recommendation on the Ethics of Artificial Intelligence**

- In November 2021 ,193 countries reached a groundbreaking agreement at UNESCO on how AI should be designed and used by governments and tech companies.
- UNESCO's Recommendation on the Ethics of Artificial Intelligence aims to fundamentally shift the balance of power between people, and the businesses and governments developing AI.
- Countries which are members of UNESCO have agreed to implement this recommendation by enacting actions to regulate the entire AI system life cycle, ranging from research, design and development to deployment and use.
- It establishes the need to keep control over data in the hands of users, allowing them to access and delete information as needed.
- It also calls on member states to ensure that appropriate safeguards schemes are devised for the processing of sensitive data and effective accountability, and redress mechanisms are provided in the event of harm.
- Additionally, the broader socio-cultural impacts of AI-related technologies are also addressed, with the Recommendation taking a strong stance that AI systems should not be used for social scoring or mass surveillance purposes; that particular attention must be paid to the psychological and cognitive impact that these systems can have on children and young people; and that member states should invest in and promote not only digital, media and information literacy skills, but also socio-emotional and AI ethics skills to strengthen critical thinking and competencies in the digital era.
- In a number of countries, the principles of the Recommendation are already being used in AI regulation and policy, demonstrating their practical viability. Finland provides an example of good practice in this regard, with its 2017 AI Strategy.
  - This was the first of its kind in any European country and demonstrated how governments can effectively promote ethical AI use without compromising the desire to be on the cutting edge of new technologies.

**Way Forward**

- There is an urgent need to tackle the moral and ethical issues related to AI through an universal code of ethics which emcompasses all.
- The right incentives for ethical AI governance need to be established in national and sub-national policy.
- If AI is not regulated properly, it is bound to have unmanageable implications.
- All countries, including India, need to be legally prepared to face any challenges arising from the AI .
- Protecting personally identifiable information is critical to ensure privacy and eliminate unconscious bias.

## PRELIMS

### 1. Anti-defection Law

Recently the political development in Maharashtra saw a group of MLAs defecting from the state legislative assembly.

**Anti-defection Law:**

**Origin:**

- Aaya Ram Gaya Ram was a phrase that became popular in Indian politics after a Haryana MLA Gaya Lal changed his party thrice within the same day in 1967.
- The anti-defection law was a response to the similar toppling of multiple state governments by party-hopping MLAs.
- Parliament added it to the Constitution in **1985**.

**10th Schedule:**

- The Tenth Schedule was inserted in the Constitution in by 52nd Amendment Act.
- It lays down the process by which legislators may be disqualified on grounds of defection.

**What constitutes defection?**

- The law covers three kinds of scenarios:
  - **Voluntarily giving up:**

        - When legislators elected on the ticket of one political party "voluntarily give up" membership of that party or vote in the legislature against the party's wishes.
        - A legislator's speech and conduct inside and outside the legislature can lead to deciding the voluntarily giving up membership.
    - **Independent members:**
        - The second scenario arises when an MP/MLA who has been elected as an independent joins a party later.
    - **Nominated legislators:**
        - The law specifies that nominated legislators can join a political party within six months of being appointed to the House, and not after such time.
    - Violation of the law in any of these scenarios can lead to a legislator being penalised for defection.
- **Applicable to:**
    - The law applies to both Parliament and state assemblies.
- **Deciding authority:**
    - The Presiding Officers of the Legislature (Speaker, Chairman) are the deciding authorities in such cases.
    - The Supreme Court has held legislators can challenge their decisions before the higher judiciary.
- **How long does it take for deciding cases of defection?**
    - The law does not provide a time frame within which the presiding officer has to decide a defection case.
    - The court in its recent judgment has held that, ideally, Speakers should take a decision on a defection petition within three months.
- **Exceptions in Law:**
    - Legislators may change their party without the risk of disqualification in certain circumstances.
        - The law allows a party to merge with or into another party provided that at least two-thirds of its legislators are in favour of the merger.
        - In such a scenario, neither the members who decide to merge, nor the ones who stay with the original party will face disqualification.

**2. <u>NIPUN Scheme</u>**

Recently, the government launched the NIPUN (National Initiative for Promoting Upskilling of Nirman workers) scheme to train over 1 lakh construction workers.

**<u>More about the scheme:</u>**

- The project NIPUN is an initiative of the Ministry of Housing & Urban Affairs (MoHUA) under its flagship scheme of the Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM).
- **Aim:**
    - It aims to train over 1 lakh construction workers, through fresh skilling and upskilling programmes.
    - It will also provide workers with work opportunities even in foreign countries.
- **Role of National Skill Development Corporation (NSDC):**
    - NSDC, the nodal agency under the Ministry of Skill Development & Entrepreneurship (MSDE), will be the Implementation Partner for the project.
        - The project implementation is divided into three parts –
            - Training through Recognition of Prior Learning (RPL) at construction sites,
            - Training through Fresh Skilling by Plumbing and Infrastructure SSC and
            - International Placement through industries/ builders/ contractors in countries such as the Kingdom of Saudi Arabia, UAE and other GCC countries.

The courses are aligned with National Skills Qualifications Framework (NSQF).

NSDC will be responsible for the overall execution of training, monitoring and candidate tracking. It will provide trainees with 'Kaushal Bima', three-year accidental insurance with coverage of INR 2 lakhs.

Digital skills such as cashless transactions, orientation about entrepreneurship, and EPF and BOCW facilities will also be provided to trainees.

**3. <u>5 Years of Goods and Services Tax (GST)</u>**

Five years after the Goods and Services Tax (GST) came into force, the much-debated indirect tax regime seems to be finally stabilising.

**Objectives and need of GST**

- The reasons for adopting a single rate structure in most countries are to have a simple tax system, prevent misclassifications and litigations arising therefrom, and to avoid an inverted duty structure of taxes on inputs exceeding those on outputs requiring detailed scrutiny and refunds.

**Overview of GST**

- It is India's biggest indirect tax reform and was introduced in India from 1 July 2017.
- It follows a multi-stage collection mechanism.
  - It is a single tax on the supply of goods and services, right from the manufacturer to the consumer.
    - Credits of input taxes paid at each stage will be available in the subsequent stage of value addition, which makes GST essentially a tax only on value addition at each stage.
    - The final consumer will thus bear only the GST charged by the last dealer in the supply chain, with set-off benefits at all the previous stages.
- It is meant to be a unified indirect tax across the country on products and services.

**Salient Features of GST**

- It is applicable on 'supply' of goods or services as against the present concept on the manufacture of goods or on sale of goods or on provision of services.
- It is based on the principle of destination-based consumption taxation as against the present principal of origin-based taxation.
- It is a dual GST with the Centre and the States simultaneously levying tax on a common base.
  - The GST to be levied by the Centre would be called Central GST(CGST) and that to be levied by the States would be called State GST (SGST).
  - An Integrated GST (IGST) would be levied an inter-state supply (including stock transfers) of goods or services.
  - GST is being levied at four rates viz. 5%, 12%, 16% and 28%.
- The GST would apply to all goods other than alcoholic liquor for human consumption and five petroleum products, viz. petroleum crude, motor spirit (petrol), high speed diesel, natural gas and aviation turbine fuel.
- The GST Council headed by the Union Finance Minister is the governing and key decision-making body for GST.

**Achievements**

- GST revenues have shown reasonably high buoyancy with collections of over Rs 1 lakh crore in the last 10 months and touching a record of Rs 1.68 lakh crore in April 2022.
- The GSTN has been able to stabilise the technology platform.
- Mandating the issue of e-invoicing for all businesses above Rs 100 crore has enabled better invoice matching and detection of fake invoices that were used to claim the input tax credit.
  - This has helped to improve tax compliance and has also enabled better enforcement.
- In India, it has been a remarkable achievement and a unique experiment in cooperative federalism.
- In this, both the Union and the state governments gave up their tax autonomy in favour of harmonising domestic trade taxes.
- It helped the country in transitioning to an automated indirect tax ecosystem.
  - From electronic compliances, generation of e-invoices to tracking movement of goods through e-waybill - everything is now online
- The E-invoicing system helped reduce fake invoicing.
  - Use of technology with online bill generation has resulted in smoother consignment movement and much fewer disputes with officials.
- After the introduction of GST, there has been a significant reduction in transaction costs.
- GST has improved the competitiveness of domestic industries in the international market by removing hidden and embedded taxes.
- A system of seamless tax-credits throughout the value-chain, and across boundaries of States, would ensure that there is minimal cascading of taxes.
- This would reduce hidden costs of doing business.
- GST gave a major boost to the 'Make in India' initiative of the Government of India by making goods and services produced in India competitive in the National as well as International market.

**ANSWER WRITTING**

**Q. Displacement of tribals and other marginalized communities has been one of the major consequences of development process in India. Comment.(150 words)**



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Ph.: 8984111101, 8093083555. Web: www.vanikias.com, E-mail: vaniksias@gmail.com

**Introduction**

"If you are to suffer, you should suffer in the interest of the country." - Jawaharlal Nehru, speaking to villagers who were to be displaced by the Hirakud Dam in 1948. Since independence, tribals and other marginalised communities have been at the forefront of receiving negative externalities, arising from our modern developmental process. Displacement of these groups has been one of the major consequences of this process, because they live amidst India's verdant forests, flowing rivers and on top of the most valuable minerals.

**Body**

- As these resources have gained market value, the tribals have had to make way for commercial forest enterprises, large and small dams and mines in the name of development.
- As sociologist Walter Fernandes has documented, no fewer than 40% of those displaced by development projects are tribals, although they constitute only 8% of the population.
- In the past, dam projects like Tehri and Sardar Sarovar, displaced thousands and many have been uprooted four-five times within decades. For example-Thirty thousand villagers of Madhya Pradesh were first displaced during the construction of the Rihand dam (late '50s); later again when coal was found in the mid-70s; a third time, to make room for industry; and finally, when the Singrauli mega thermal power station was mooted in the late '80s.
- Tribals and marginalised populations traditionally depend on common property for survival, unlike farmers who own land individually. Thus, their rights over natural resources are easily appropriated, for example-Van Gujjars, the nomads of the Rajaji National Park have been resisting their ouster, bereft of any legal recourse.
- Despite having adequate laws like Forest Rights Act 2006, Land Acquisition Act 2013, Panchayats (Extension to Scheduled Areas) Act 1996 for empowering and providing rights to tribals; issues related to land conflict, rehabilitation and resettlement still persist. For example: Protest of Dongria kondh tribes against Bauxite mining in Niyamgiri hills, Odisha.

**Conclusion**

Our development process should not be lopsided, benefiting only a privileged section of the population. Additionally, Social Impact Assessment and, rights of tribals and marginalised should be prioritized in any developmental activity, without which vision of inclusive development will remain incomplete.

## QUIZ

1. Consider the following statements
   1) It involves the use of algorithms to parse data and learn from it which enables deciding or predicting
   2) It is a function that mimics the workings of the human brain in processing data for use in detecting objects, recognizing speech, translating languages, and making decisions
   Which of the above is/are correct about Deep Learning ?
   a) Only 1
   **b) Only 2**
   c) Both 1 and 2
   d) None of the Above
2. Consider the following statements regarding Artificial Intelligence.
   1. It describes the action of machines accomplishing tasks that have historically required human intelligence
   2. Facebook's list of suggested friends is an example of Artificial Intelligence's work
   **a**. 1 only
   b. 2 only
   **c. Both 1 and 2**
   d. Neither 1 nor 2
3. The project NIPUN is an initiative of which of the following ministries?
   **(a) Ministry of Housing & Urban Affairs**
   (b) Ministry of Education
   (c) Ministry of Rural Development
   (d) Ministry of Finance
4. Consider the following statements about anti-defection law
   1. The Tenth Schedule was inserted in the Constitution in by 62nd Amendment Act.
   2. It lays down the process by which legislators may be disqualified on grounds of defection.
   3. The law does not provide a time frame within which the presiding officer has to decide a defection case.
   Select the correct answer from the following
   (a) 1 and 2 only
   **(b) 2 and 3 only**



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(c) 1 and 3 only
(d) All of the above

5. Consider the following statements regarding GST
   1. GST is applicable on 'supply' of goods or services
   2. GST is based on the principle of destination-based consumption taxation
   3. CGST, SGST & IGST are levied at rates which are decided by the Centre only.

   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) All of the above
6. Consider the following statements about Bedti-Varada Link river-interlinking project:
   1. The proposal envisages diversion of surplus waters of Varda basin to Tungabhadra sub-basin.
   2. Provision for compensatory afforestation on account of submergence of forest land has been made.
   3. No important historical monuments and archaeological structures will be coming under submergence.

   (a) 1 and 2 only
   **(b) 2 and 3 only**
   (c) 1 and 3 only
   (d) All of the above
7. Which of the following provisions of the constitution is/are violated by the Islamic form of divorce Talaq-e-Hasan ?
   1. Article 15
   2. Article 16
   3. Article 19
   4. Article 25

   Select the correct code
   **a. 1 and 4 only**
   b. 2, 3, 4 only
   c. 2 and 4 only
   d. 1 and 3 only
8. Consider the following statements:
   1. Azooxanthellate corals are a group of corals that are able to derive nourishment from the sunlight .
   2. These groups of corals are deep-sea representatives, with the majority of species reporting from between 200 m to 1000 m.
   3. Their occurrences are not reported from shallow coastal waters and Continental shelves.

   Which of the above statement(s) is/are correct?
   **a. 2 only**
   b. 1 and 3 only
   c. 1 and 2 only
   d. 2 and 3 only
9. Which of the following statement/s is/are correct regarding Quantum diamond microscope?
   1. It has the ability to image magnetic fields that change within nanoseconds.
   2. It can measure the biological activity of neurons and dynamics of vortices in superconductors.

   Select the correct code
   a. 1 only
   **b. 2 only**
   c. Both 1 and 2
   d. Neither 1 nor 2
10. The term Private Access token has been recently seen in news, refers to
   a**. It helps to identify Hyper Text Transfer Protocol requests from legitimate devices and people without compromising the identity.**
   b. It is cryptographic asset on a blockchain with unique identification codes and metadata that distinguish them from each other.
   c. It is a digital token which represents a specific amount of digital resources one can own, assign to another, or redeem later.
   d. It enable clients to securely call protected web APIs, and are used by web APIs to perform authentication and authorization.



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