

## General Studies – 3; Topic: Science and Technology- developments and their applications and effects in everyday life

### Artificial Intelligence

#### 1) Introduction

- Artificial intelligence is the branch of computer science concerned with making computers behave like humans.
- It is the study of ways in which machines can be made to have sufficient creative reasoning power to perform mental task
- Examples of problem that falls under the area of Artificial Intelligence include understanding of language, recognising scenes, finding a way to reach an object that is far overhead etc.
- In addition Artificial Intelligence includes expert tasks, such as diagnosing diseases, designing computer system and planning scientific expedition.
- AI can be used in places where you have to take a decision and recommend products

#### 2) Applications of AI

- **Heavy Industries & Space**
  - a) Through AI an entire manufacturing process can be made totally automated, controlled & maintained by computer system
  - b) Example: car manufacturing machine tool production, computer chip production. Etc.
  - c) They carry out dangerous tasks like handling hazardous radioactive materials
- **Finance**
  - a) Banks use intelligent software application to screen & analyse financial data.
  - b) Software that can predict trends in stock market have been created which have been known to beat humans in predictive power.
- **Aviation**
  - a) Air lines use expert system in planes to monitor atmospheric condition & system status.
- **Weather Forecast**
  - a) Neural Network is used for predicting weather condition.
  - b) Previous data are fed to a neural network which learns the pattern & uses that knowledge to predict weather pattern.
- Microsoft develops AI to help cancer doctors find the right treatments
- Google uses machine learning to auto-complete search queries and often accurately predicts what someone is looking for.
- Facebook and Amazon use predictive algorithms to make recommendations based on a user's reading or purchasing history.
- AI is the central component in self-driving cars— which can now avoid collisions and traffic congestion
- **Banking sector**
  - a) Banks may look at using AI for enhancing customer experience, security, and risk management
  - b) Intuitive and personalised customer experience is one of the benefits that AI can provide
  - c) With the use of AI, banks' call centre work could get reduced to a certain extent.
- **Repetitive Jobs**
  - a) Repetitive jobs which are monotonous in nature can be carried out with the help of machine intelligence.
  - b) Machine intelligence can be employed to carry out dangerous tasks

- **Difficult Exploration**
  - a) Artificial intelligence and the science of robotics can be put to use in mining and other fuel exploration processes.
  - b) These complex machines can be used for exploring the ocean floor and hence overcoming the human limitations.
- **Error Reduction**
  - a) Artificial intelligence helps us in reducing the error and the chance of reaching accuracy with a greater degree of precision is a possibility.
  - b) Artificial intelligence is applied in various studies such as exploration of space.
  - c) They are created and acclimatized in such a way that they cannot be modified or get disfigured or breakdown in the hostile environment

### 3) Disadvantages

- Fourth Industrial Revolution, built around AI, eliminates jobs, both blue and white collar, at a rapid pace
- AI could drive global unemployment to 50%, wiping out middle-class jobs and exacerbating inequality.
- In China the AI has already affected thousands of jobs, as electronics manufacturers develop precision robots to replace human workers.
- automation's effect on unemployment would have huge political consequences
- **High Cost:**
  - a) Creation of artificial intelligence requires huge costs as they are very complex machines. Their repair and maintenance require huge costs.
  - b) They have software programs which need frequent upgradation to cater to the needs of the changing environment.
- **No Replicating Humans**
  - a) Intelligence is believed to be a gift of nature. An ethical argument continues, whether human intelligence is to be replicated or not.
  - b) Machines do not have any emotions and moral values. They perform what is programmed and cannot make the judgment of right or wrong.
  - c) They cannot take decisions if they encounter a situation unfamiliar to them. They either perform incorrectly or breakdown in such situations.
- **No Improvement with Experience**
  - a) Unlike humans, artificial intelligence cannot be improved with experience. With time, it can lead to wear and tear.
  - b) Machines are unable to alter their responses to changing environments.
  - c) In the world of artificial intelligence, there is nothing like working with a whole heart or passionately.
  - d) There is no sense of belonging or togetherness or a human touch.
- **No Original Creativity**
  - a) They are no match for the power of thinking that the human brain has or even the originality of a creative mind.
  - b) The inherent intuitive abilities of the human brain cannot be replicated.
- If the control of machines goes in the wrong hands, it may cause destruction.
- Machines won't think before acting. Thus, they may be programmed to do the wrong things, or for mass destruction.

#### 4) **Recommendations**

- For India to maximally benefit from the AI revolution, it must adopt a deliberate policy to drive AI innovation, adaptation, and proliferation in sectors beyond consumer goods and information technology services.
- Policymakers should make AI a critical component of the prime minister's flagship Make in India, Skill India, and Digital India programs
- offering incentives for manufacturers, creating regional innovation clusters for manufacturing automation and robotics in partnership with universities and start-ups
- The National Education Policy must make radical recommendations on alternative models of education that would be better suited to an AI-powered economy of the future.
- The government should identify public sector applications like detecting tax fraud, preventing subsidy leakage, and targeting beneficiaries, where current advances in AI could make a significant impact.
- India must view machine intelligence as a critical element of its national security strategy and evaluate models of defense research in collaboration with the private sector and universities.

