# ARTIFICIAL INTELLIGENCE (AI)

Simple and short notes | Beginner-friendly study material

## 1. What is Artificial Intelligence?

Artificial Intelligence (AI) is a branch of computer science that makes machines perform tasks that usually need human intelligence. Examples include learning, problem-solving, understanding language and recognizing images.

**Example:** A voice assistant understanding your question and giving an answer.

## 2. Goals of AI

- To make machines learn from data and experience.
- To solve problems and make decisions.
- To understand human language.
- To recognize images, speech and patterns.
- To automate tasks and help people work faster.

## 3. Types of AI

- **Narrow AI (Weak AI):** Designed for one specific task. Examples: face recognition, recommendation systems and voice assistants.
- **General AI (Strong AI):** A theoretical type of AI that could perform a wide range of intellectual tasks like a human.
- **Super AI:** A hypothetical AI that would exceed human intelligence.

## 4. Applications of AI

- **Healthcare:** Helps analyze medical images and support diagnosis.
- **Education:** Personalized learning, tutoring and automatic evaluation.
- **Banking:** Fraud detection and customer support.
- **Agriculture:** Crop monitoring and pest detection.
- **Transport:** Route planning and driver-assistance systems.
- **Entertainment:** Movie, music and video recommendations.

## 5. Important Branches of AI

- **Machine Learning (ML):** Enables computers to learn patterns from data.
- **Deep Learning:** Uses multi-layer neural networks to learn complex patterns.
- **Natural Language Processing (NLP):** Helps computers understand and generate human language.
- **Computer Vision:** Helps computers understand images and videos.
- **Robotics:** Combines AI with machines that perform physical tasks.

## 6. How AI Works

- **Step 1 – Data:** Collect information such as text, images or numbers.
- **Step 2 – Training:** An AI model learns patterns from the data.
- **Step 3 – Testing:** Check how well the model works on new data.
- **Step 4 – Prediction:** The model uses what it learned to produce an output.
- **Step 5 – Improvement:** Update the model when better data or methods are available.

## 7. Advantages of AI

- Can process large amounts of data quickly.
- Can work continuously without getting tired.
- Can reduce repetitive manual work.
- Can improve accuracy in suitable tasks.
- Can support faster decision-making.

## 8. Disadvantages and Challenges of AI

- Can be expensive to develop and maintain.
- May produce incorrect or biased results.
- Some jobs and tasks may change due to automation.
- Can create privacy and security risks.
- Needs human checking, especially for important decisions.

## 9. AI vs Human Intelligence

| AI | Human intelligence |
|---|---|
| Learns from data and programmed methods. | Learns from experience, senses and reasoning. |
| Can process data very quickly. | Can use broad judgment and context. |
| Does not have human feelings or lived experience. | Has emotions and personal experiences. |

## 10. Important AI Terms

- **Algorithm:** A set of steps used to solve a problem.
- **Dataset:** A collection of data used for training or testing.
- **Model:** A system trained to recognize patterns and produce outputs.
- **Training:** The process of teaching a model using data.
- **Prediction:** The output produced by a trained model.

## 11. Short Exam Questions

- Define Artificial Intelligence.
- Write any four goals of AI.

- Explain the three types of AI.
- List five applications of AI.
- What is Machine Learning?
- Differentiate AI and human intelligence.
- Write any four advantages and disadvantages of AI.

## Quick Revision

AI makes computers perform tasks that normally require human intelligence. Key areas include Machine Learning, Deep Learning, NLP, Computer Vision and Robotics. AI is used in healthcare, education, banking, agriculture and transport. It offers speed and automation, but its results should be checked for accuracy, fairness and safety.