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# TNPSC GROUP II / IIA MAINS SCERT - SCIENCE & TECHNOLOGY QUESTION WITH ANSWER

## 5. What is Robotics? Explain its components, types and Applications

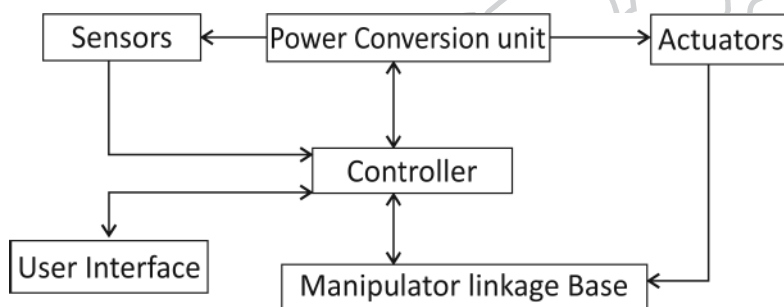
### Robotics :

- Integrated study of Mechanical Engineering, Electronics Engineering, Computer Engineering & Science.

**Robot** : A Mechanical device designed with electronics circuitry & Programmed to perform a specific task

- 1954 - George Devol - 1st digitally operated programmable robot - 'Unimate'.

### Components :



### Types :

#### 1. Human Robot :

- Resemble humans in appearance
- Replicate human activities - Walking, Lifting & Sensing

#### 2. Industrial Robots : Types :

- Cartiessian
- SCARA - Selective Compliance Assembly Robot Arm
- Cylindricat
- Delta
- Polar
- Vertically articulated

**Benefits :**

- a) Arc & Spot Welding
- b) Material Handling
- c) Machine Tending

**3. Artificial Intelligence**

**Aim :** Bring in Human like behaviour in robots.

**Applications :**

- a) Face recognition
- b) Computer games
- c) Traffic regulation
- d) Translation of words

**4. Nanorobots :**

- a)  $10^{-9}$  m - Nanometer
- b) Microscopic level - Perform task in very small spaces.
- c) Future application - Medical field - In Blood streams, Small Surgical procedures, repair individual cells.
- d) China - World first autonomous DNA robot to combat cancer tumour.

**Advantages :**

1. Never gets tired like humans - absenteeism reduced.
2. More precise & Error free in task performing
3. Work in extreme environmental conditions
4. In dangerous situations - Bomb detection & deactivation
5. In warfare, save human lives
6. In chemical Industries especially in Nuclear plants.

**Disadvantages :**

1. No sense of emotions or consciences
  2. Unemployment will increase
  3. Cannot handle unexpected situations
  4. In case of malfunctions - requires significant time
  5. In Decision making - Robots cannot replace humans
- Till the robot reaches the level of human intelligence, the humans in workplace will exist

Robots - Made of Aluminium & Steel