

Advanced Approaches in Mechatronics:-

- Intelligent autonomous inspection systems
- Intelligent decision-making systems.
- Autonomous production cells.
- Flexible manufacturing system (FMS)
- Bio robotics.
- Endoscopic and orthopedic surgery
- magnetically levitated vehicle
- Robotics in nuclear inspection & space applications etc.,

Intelligent Autonomous Inspection Systems:-

- Detect problems early & reduce the potential of serious equipment failures.
- Various problems are tracked & transmitted from the vehicle to computer via wireless data communication.

Intelligent decision making systems.

- Is a SW package for multiple criteria decision analysis.
- Can handle hybrid types of uncertainty like missing data, judgements etc.
- Supporting informed & transparent decision making.

Autonomous production cells

- Is to perform machining operations autonomously with a high degree of reliability.
- it is achieved through the integration of planning, machining and monitoring functions directly on the machine.

Flexible manufacturing system:-

- is a mfg system in which there is some amount of flexibility that allows the system to react in case of changes, whether predicted/unpredicted.

- 2 subcategories
 - machine flexibility (ability to change the order of the system)
 - Routing flexibility, (ability to use multiple machines to perform the same operation on a part).

Biorobotics:-

- is a term that loosely covers the fields of cybernetics, bionics & even genetic engineering as a collective study.

- how to make robots that emulate / simulate living biological organisms mechanically (or) even chemically.

Endoscopic & orthopedic surgery:-

- going through small incision / natural body opening in order to diagnose & treat disease.

- also named as minimally invasive surgery (MIS) (i.e) diagnosis & treatments can be done with reduced body cavity invasion

- orthopedic surgery treat number of conditions that affect the bones, joints, muscles, ligaments, tendons & nerves.

magnetically levitated vehicle:-

- is a transport method that uses magnetic levitation to move vehicles without touching the ground.

- with maglev, a vehicle travels along a guideway using magnets to create both lift & propulsion. there by reducing friction by a great extent & allowing very high speeds.