Engineering in Design

➢ **Module V**

❖ **Product centred and user centred design**

❖ **Product centred attributes and user centred attributes**

❖ **Value engineering**

❖ **Concurrent engineering**

❖ **Reverse engineering in design**

❖ **Culture based design**

❖ **Architectural designs**

❖ **Motifs and cultural background**

❖ **Tradition and design**

Value engineering

- ## Definition

  - Study of functions to satisfy the user needs of a quality product at low life cycle cost through well planned design with creativity

- ## "Value"

  - Defined as the true cost of a project

- ## Value equation

  - Value = Performance or Worth / Cost

Value engineering (Contd.)

Value engineering approach - Adjustable spanner which is equivalent to 7 other spanners

Reverse Engineering in Design

- **Reverse engineering**

  - ➤ **Also called as dissection**

  - ➤ **Is about 'seeing what is out there'**

  - ➤ **Consists of dissecting or taking apart competitive or similar products**

  - ➤ **Example**

    - ❖ **When a new car is launched, its competitive manufacturers may buy one and disassemble it to learn how others have manufactured it and how will it work**

Culture based design

- ## Cultural based design in India

(a) Rajasthan handicraft

(b) Kerala handicraft

(c) Nagaland handicraft

(d) Kashmir handicraft

Architectural Design

**Sustainable architectural designs – V-Guard Head Office, Kochi**

Motifs and Cultural Background

Motif

- A logo, theme, pattern, design or shape

- An element of an image

- A repeated in a pattern or design

- Commonly found in
  - Sarees, bed sheets

- Also form ornamental or decorative art
  - Example
    - » Many designs in mosques in Islamic culture are motifs, including those of the sun, moon, animals, etc.
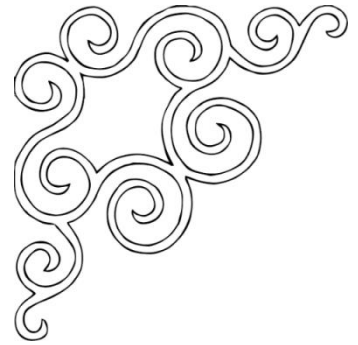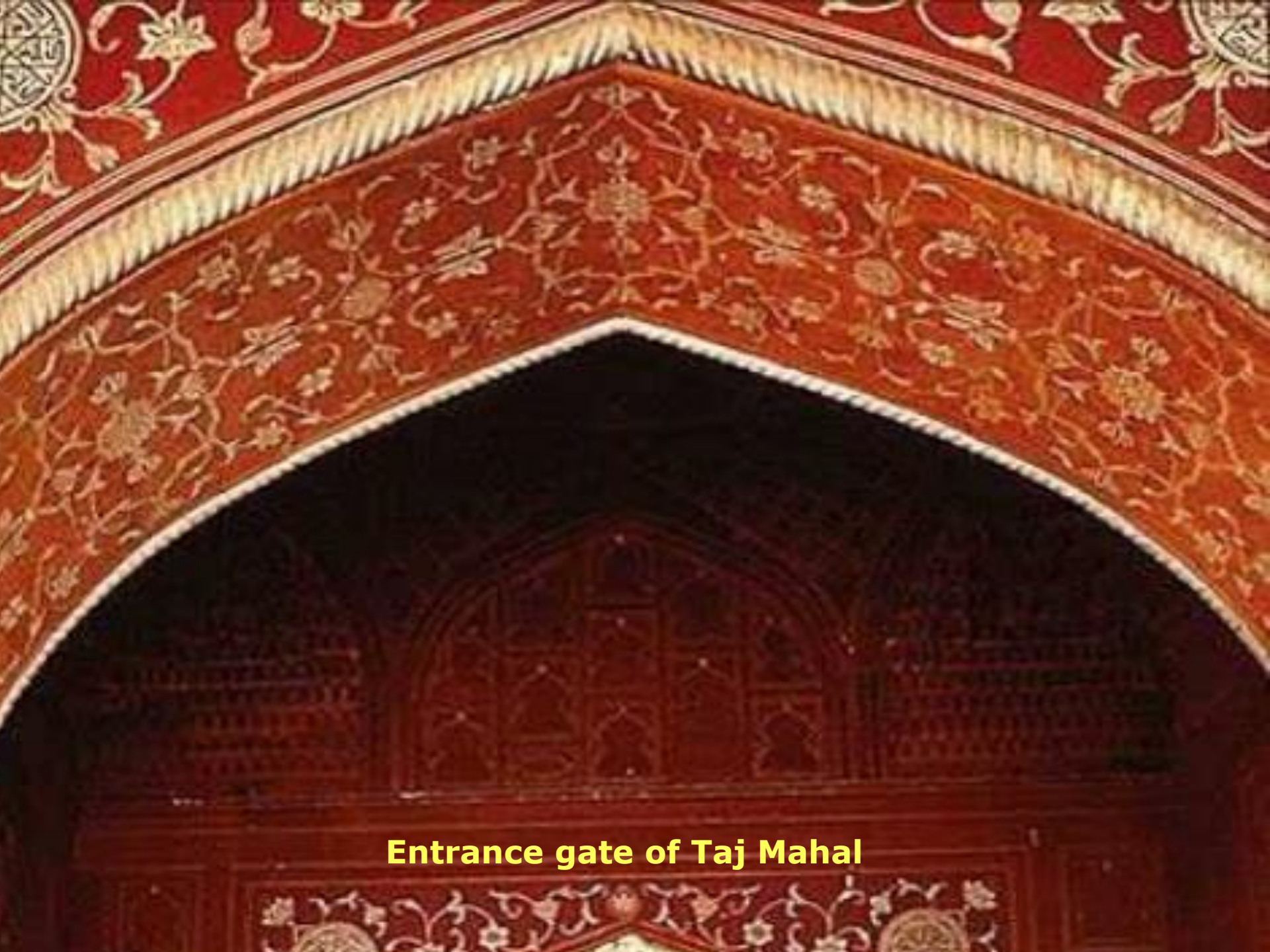
Entrance gate of Taj Mahal

Modular designs (Contd.)

**Modular design offers attachment capabilities
for different implementations**

Modular designs (Contd.)

A modular workspace

Modular designs (Contd.)

Modular computer design

Intelligent and autonomous products

❖ **Intelligent products**

- o **Products which work intelligently**

- o **Interact intelligently with the user**

  - » **An intelligent product could recognize who the user is and be aware of user preferences**

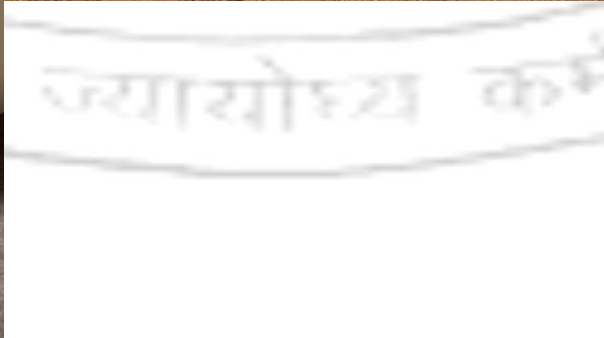- o **Circuit breakers, beacons, sensors, lights, fans, mobile phones, ACs**

❖ **Autonomous products**

- o **Manage well without constant user interaction**
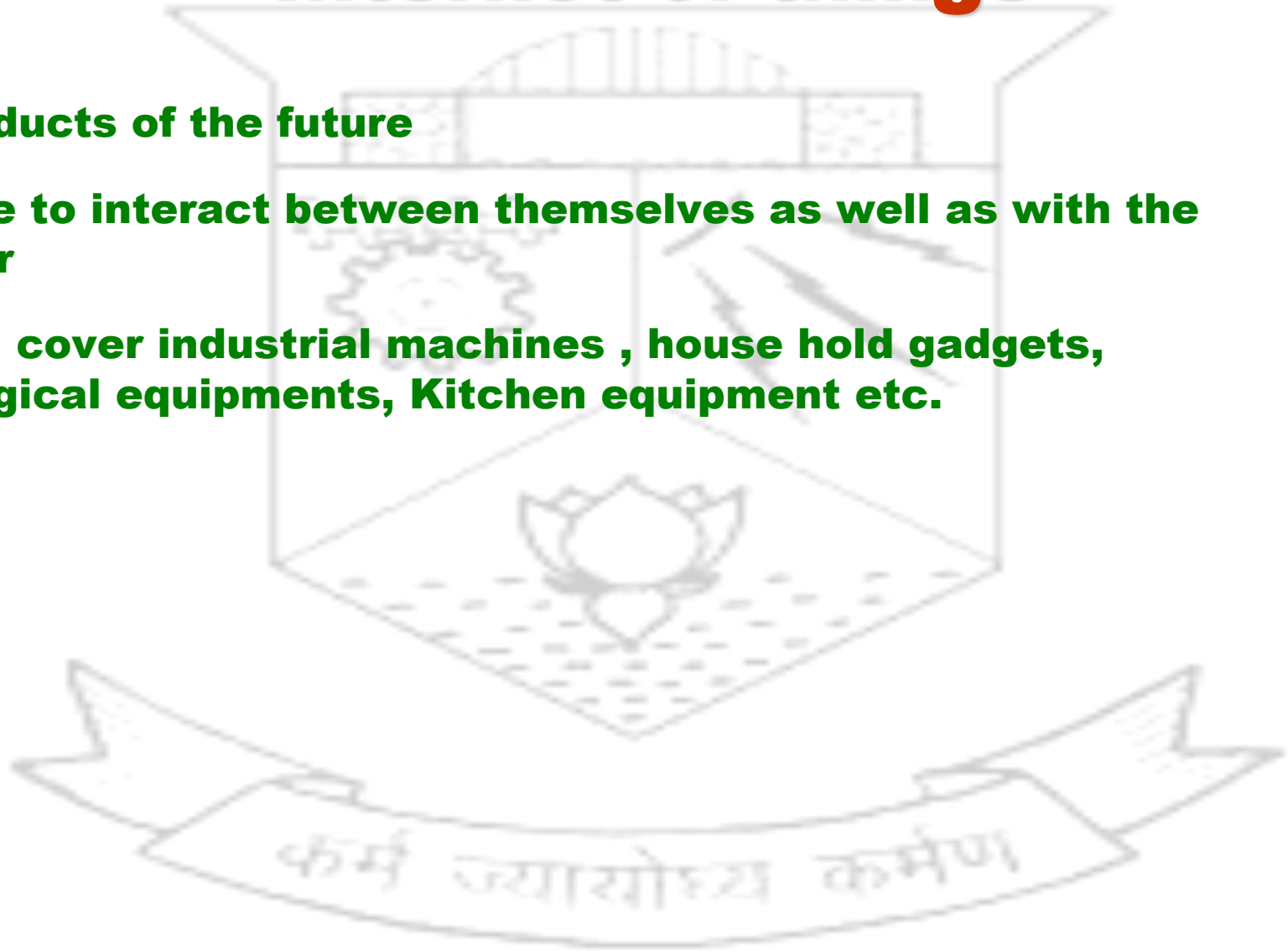
- o **A robot - Roomba robot**

Soft wall

Roomba robot

Internet of things

❖ **Products of the future**

❖ **Able to interact between themselves as well as with the user**

❖ **Can cover industrial machines , house hold gadgets, Surgical equipments, Kitchen equipment etc.**

Intellectual Property Rights

❖ **Patent**

o **Rights granted to an inventor by the state for a specified period of time**

o **Enables the inventor to safe guard against quick duplication of the design / product.**

o **Procedure to get a patent**

  » **To get the patent an application giving sufficient details of the invention is to be filed and got approved.**

o **Patent infringements are offences and are dealt by the patent laws of the country**

Intellectual Property Rights (Contd.)

❖ **Copy Right**

   o **Exclusive rights given to the original work which is creative, intellectual, or artistic forms, or "works".**

❖ **Trade mark**

   o **A recognizable sign, design or expression which distinguishes products or services of a particular trader from similar product or services of other traders.**

❖ **Trade Secret**

   o **A formula, practice, process, design Instrument, pattern, or compilation of information which is generally not known or reasonably ascertainable, by which a business can obtain economic advantage over competitors or customers.**

Intellectual Property Rights (Contd.)

❖ **Product liability**

    o **Area of law in which manufacturers, distributors, suppliers, retailers, and others who make products available to the public are held responsible for the injuries those products cause**

    o **Types of Liability:**

        » **Design defect,**

        » **Manufacturing defect,**

        » **Failure to warn (also known as marketing defects).**