Class: 2nd Class
Subject: Mechanics of Materials
Lecturer: Dr. Ali K. Kareem
E-mail: ali.kamil.kareem@uomus.edu.iq

Lec1: Introduction

References

-**Mechanics of Materials 10th Edition**

By Russell C. Hibbeler 2016

-- Solutions Manual for Mechanics of Materials in SI Units

Russell C. Hibbeler 2018

- An Introduction to Mechanics of Materials

By Vijay Gupta

Alpha Science International, Limited, 2013

-Introduction to Mechanics of Materials 1st Edition

by William F. Riley (Author), Loren W. Zachary (Author)

- **Mechanics Of Materials(Solutions)**

Beer, Johnston, & Dewolf

Mechanic of materials

Mechanic of materials is **a discipline of mechanical engineering that studies the deformable solids using numerical models**. The resistance of an element is defined as its ability to resist efforts and forces applied without breaking, permanent deformation or acquire deterioration.

الوحدات والتحويلات

$1 - Mpa$ ⟷ $\frac{N}{mm^2}$

$2 - pa$ ⟷ $\frac{N}{m^2}$

$3 - Kpa$ ⟷ $\frac{KN}{m^2}$

$4 - Ksi$ ⟵ $\frac{Kip}{in^2}$

$5 - Psi$ ⟵ $\frac{lb}{in^4}$

التحويل من m الى mm نضرب 10^3

التحويل من mm الى m نضرب 10^{-3}

التحويل من N الى KN نضرب 10^{-3}

التحويل من KN الى N نضرب 10^3

التحويل من Psi الى Ksi نضرب 10^{-3}

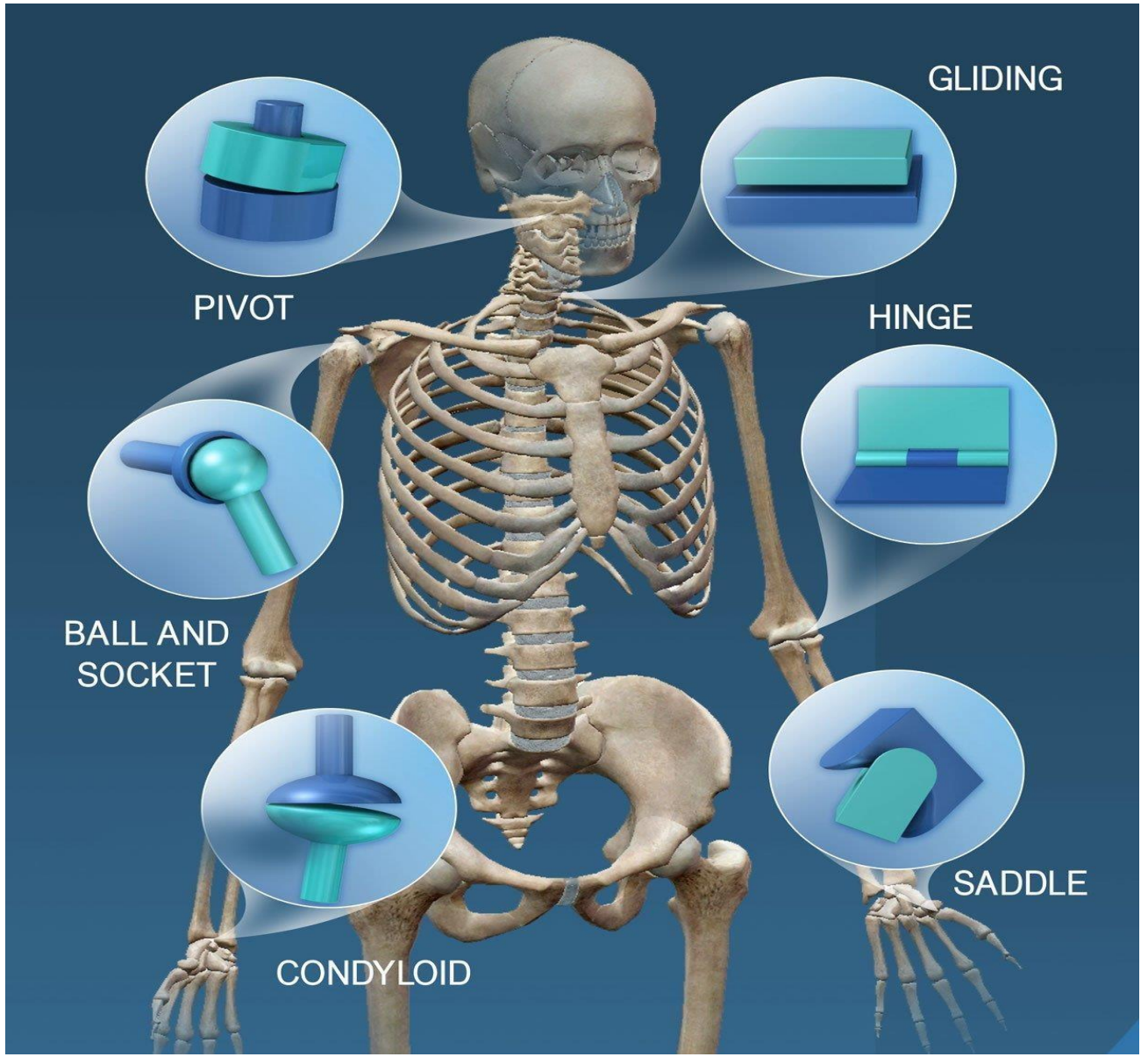
التحويل من Kpa الى Mpa نضرب 10^{-3}

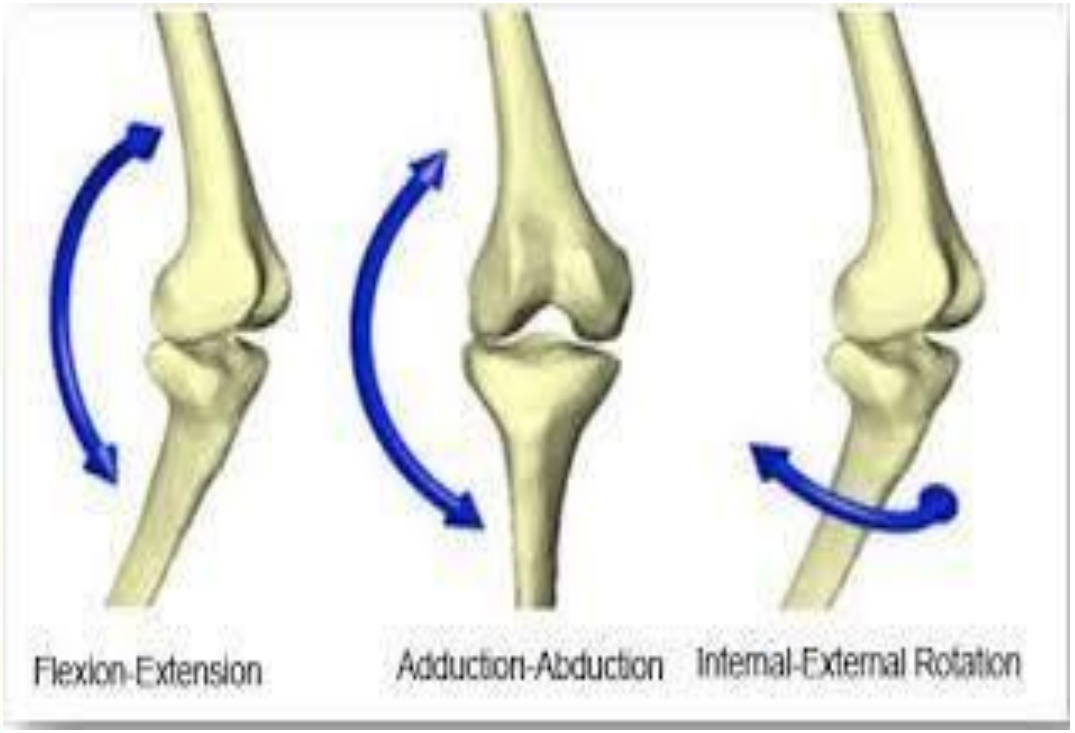
التحويل من Kpa الى pa نضرب 10^{3}

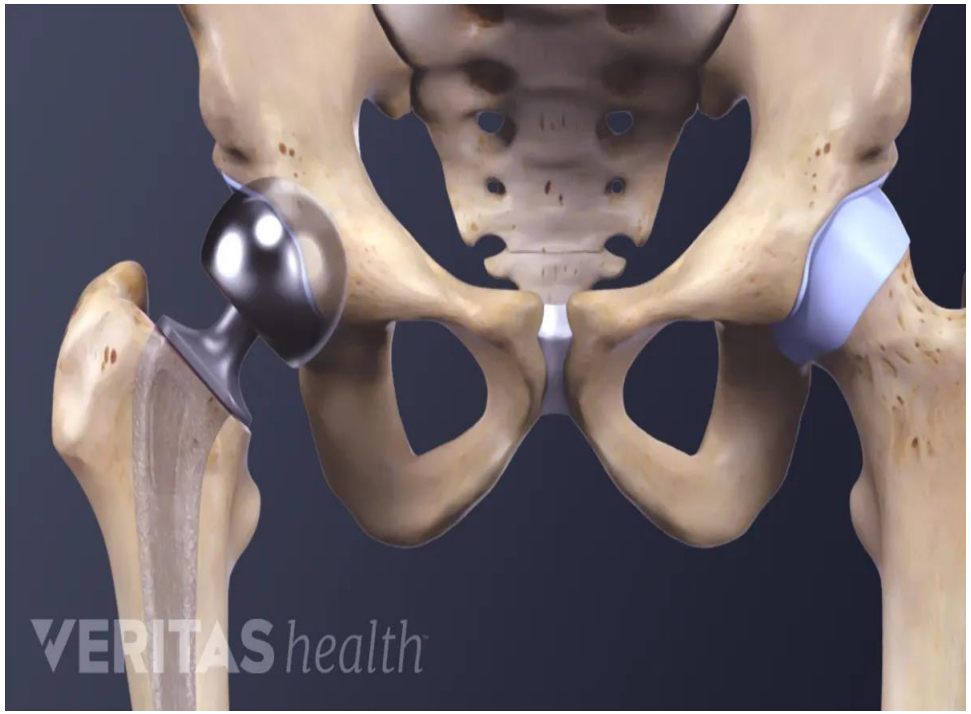
التحويل من Mpa الى pa نضرب 10^{6}

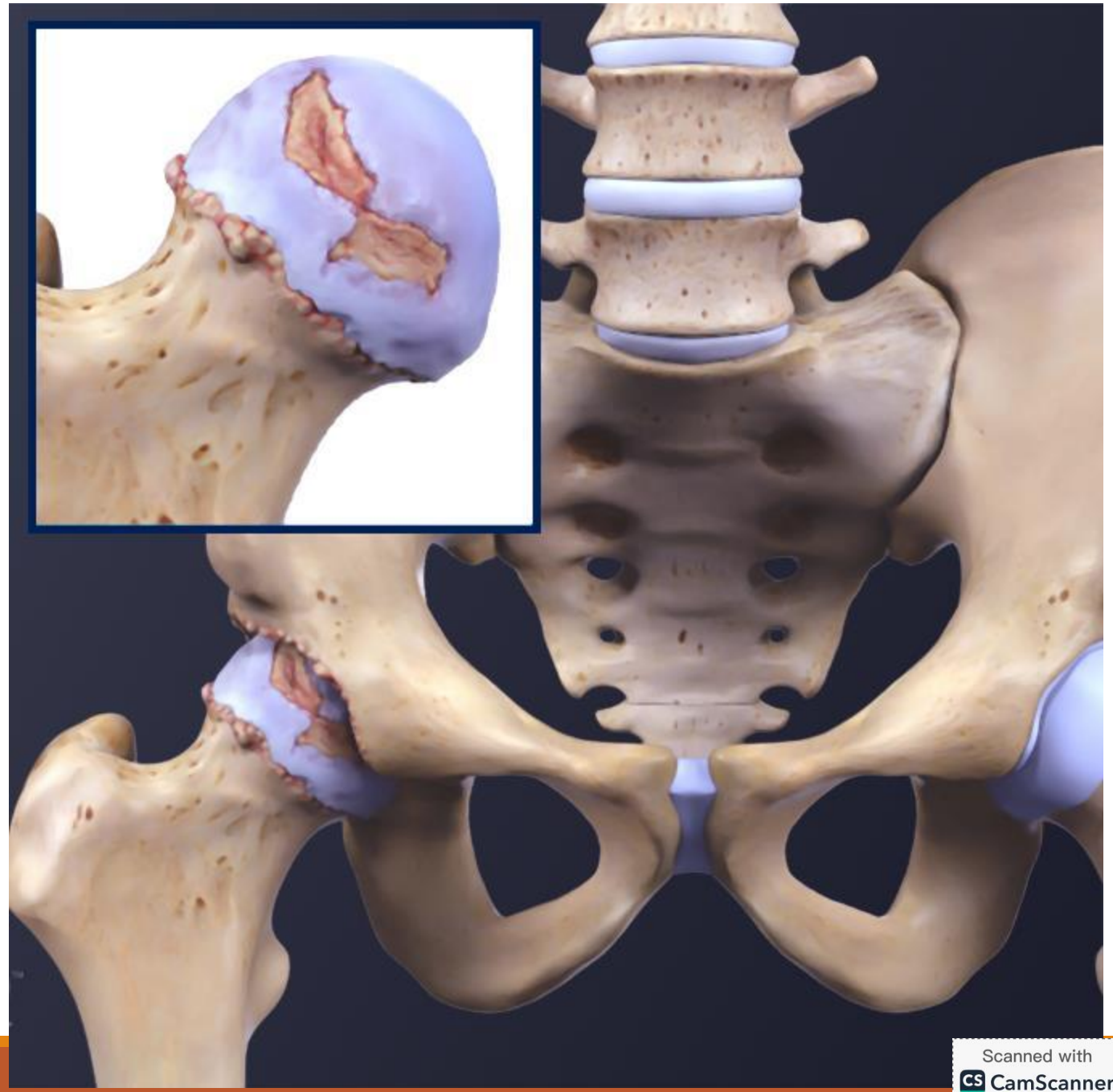
التحويل من Gpa الى pa نضرب 10^{9}

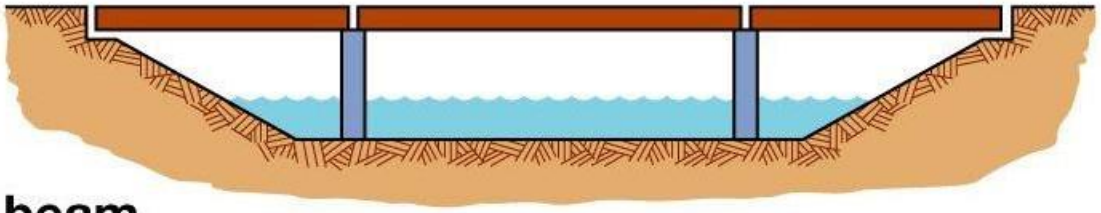
التحويل من Gpa الى Mpa نضرب 10^{3}



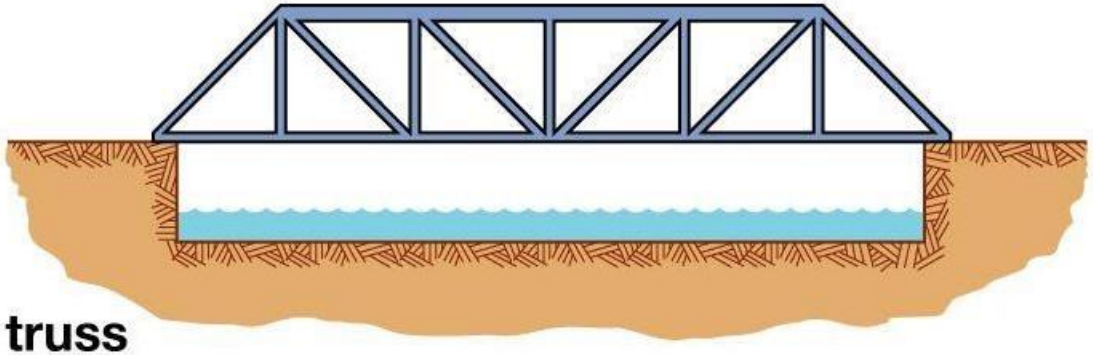




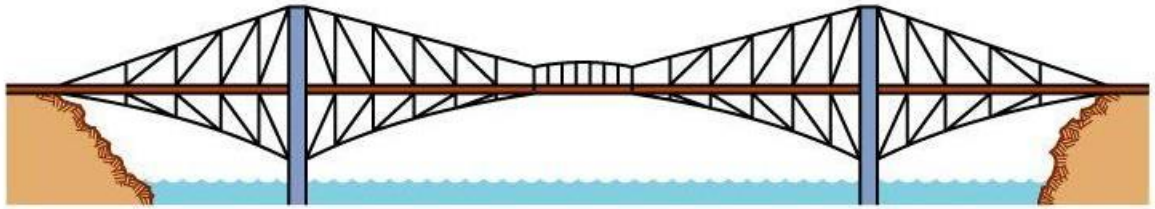




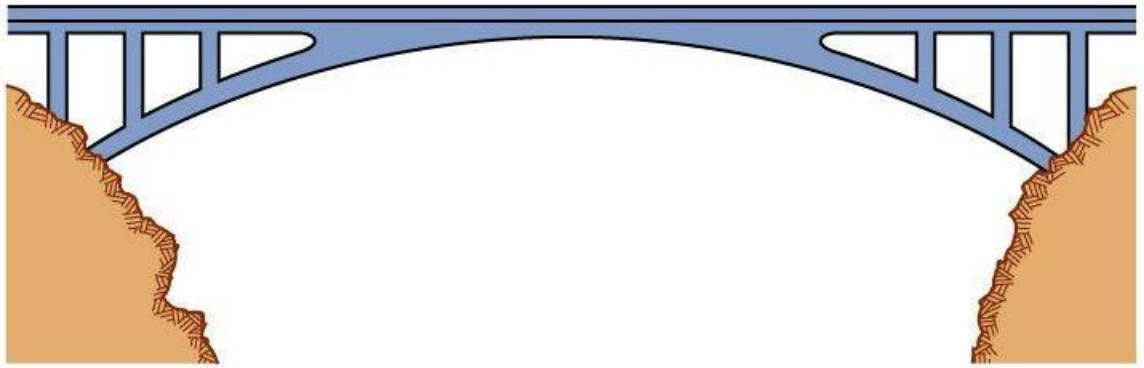
beam



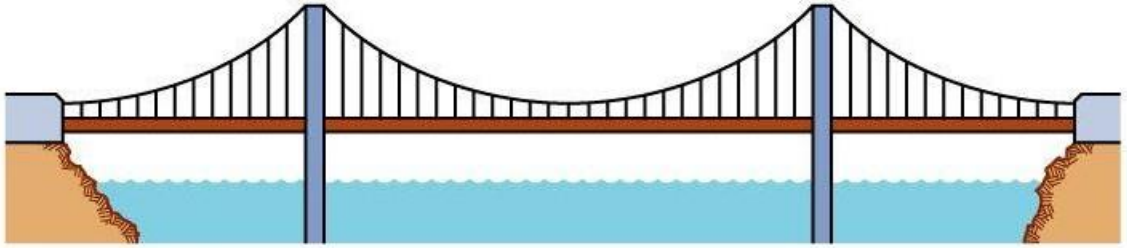
truss



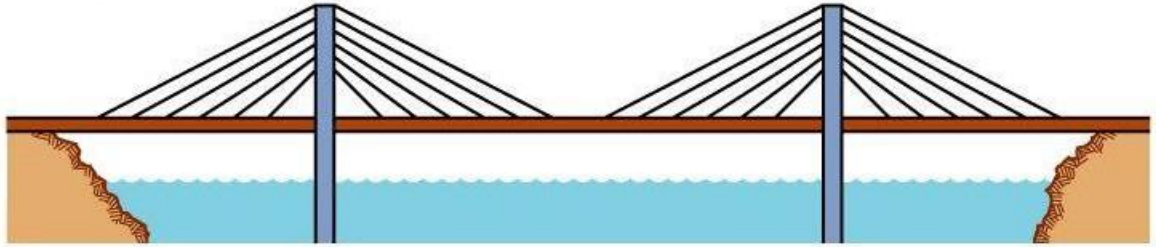
cantilever



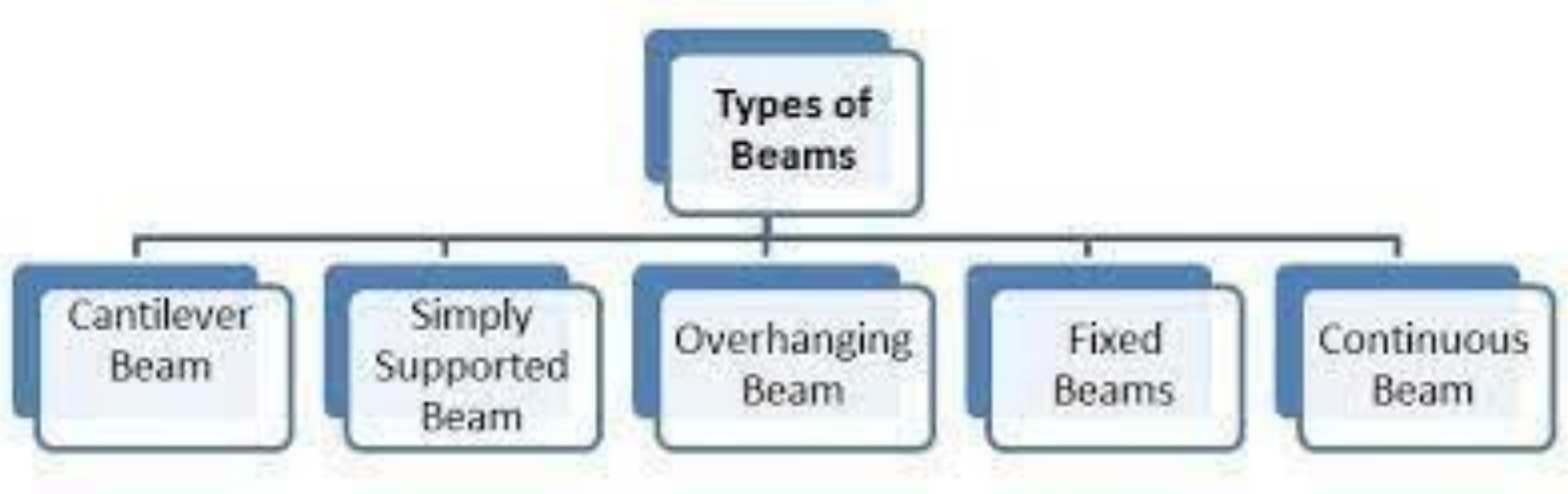
arch



suspension



cable-stayed

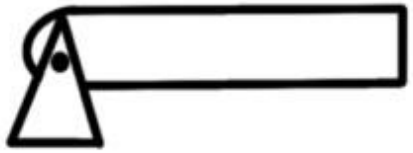


Roller

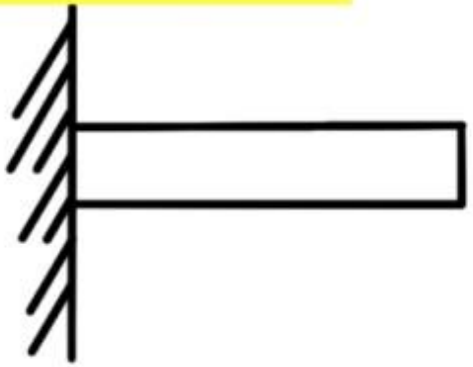
Reaction Forces

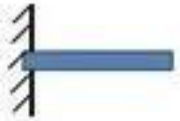
Motion

Pinned



Fixed / cantilever



S.no	Types of Support	Representation by	Reaction Force	Resisting Load
1.	**Roller Support**		Vertical	Vertical loads
2.	**Pinned Support**		Horizontal and vertical	Vertical and horizontal loads
3.	**Fixed Support**		Horizontal, vertical and moments	All types of loads Horizontal, vertical and Moments
4.	**Simple Support**		Vertical	Vertical loads

Beam Types

- Types of beams- depending on how they are supported.