Truss:-

It is rigid structure composed of number of straight members pin jointed to each other.

Trusses are used in,
-Bridges
-Transmission Towers
-Buildings
-Godwons

Types Of Trusses
1] Plane Truss
2] Rigid Truss
3] Simple Truss

1] Plane Truss:-

All the members lie in a single plane is called **plane truss.**

2] Rigid Truss:-

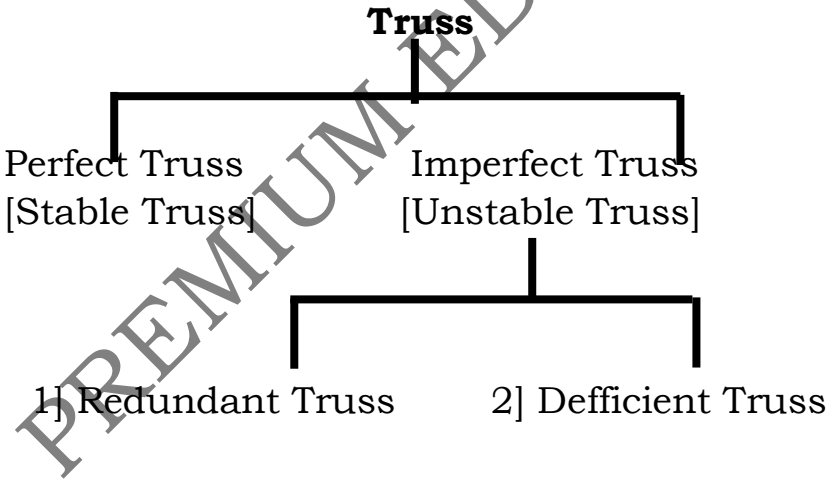
Truss which does not collapse when loaded is called **rigid truss.**

3] Simple Truss:-

The structures built from a basic triangle by adding different members is known as **simple truss**.

Classification of a Truss

A truss can be classified are as follows,



1] **Perfect Truss:- (Stable Truss)**

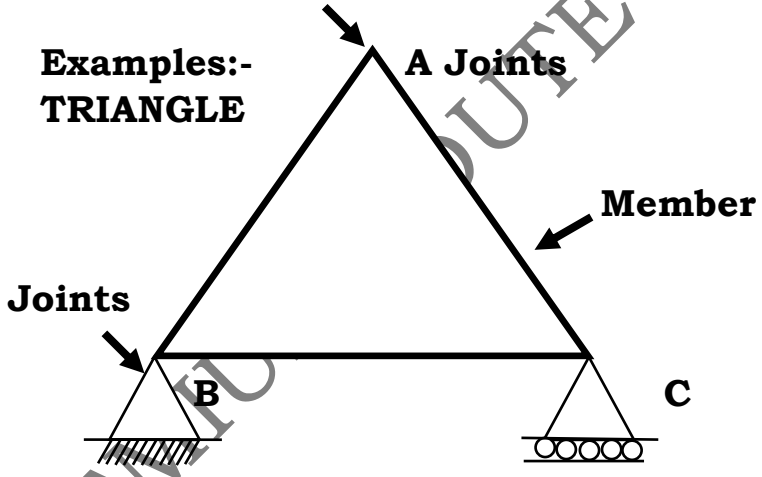
Truss which does not collapse under the loading is called as **perfect truss.**

Condition n = 2j-R is satisfied is known as **Perfect Truss.**

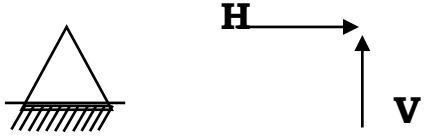
Where,

n = Number of members
j = number of joints
R = Number of Reactions

Examples:-
TRIANGLE



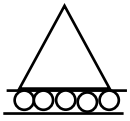
1] Hinged Support



Hinged support have two support reactions,

1] Horizontal **[H]**
2] Vertical **[V]**

2] Roller Support



Roller support have only one support Reactions,

1] Vertical **[V]**

V

Here,

n= 3

j = 3

R = 3

n =2j-3

n =2(3)-3

n = 3

Triangular Truss is example of **Perfect Truss**

2] Imperfect Truss:-[Unstable]

Truss which collapse under loading is called as **Imperfect truss.**

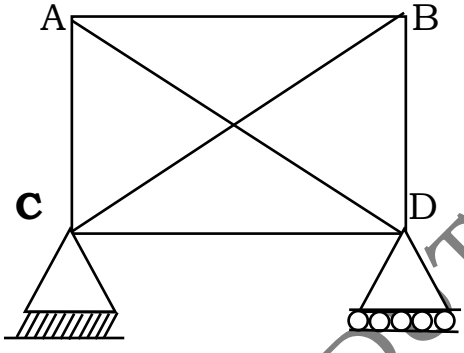
Condition,

n =2j-3 not satisfied [n ≠2j-3]

Is called **Imperfect Truss**

A] Redundant Truss:- [Over Stable Truss]

Truss in which **n>2j-3** is known as **Redundant Truss**



Here,

n =6

j=4

R=3

n =2j-3

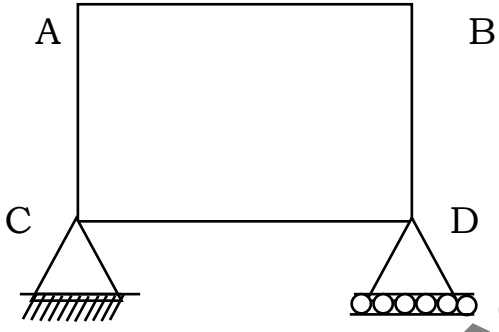
n=2(4)-3

n=5

Here, n>2j-3 .....**Redundant Truss**

B] Defficient Truss:-

Truss in which **n<2j-3**, is known as deficient truss.



Here,

j=4

n=4

R=3

n =2(4)-3

n=5 Here, n<2j-R .....**Defficient truss**

Assumptions :-

1. The joints of truss assumed to be pin connected. [Hinged]
2. The load act only at the joints.
3. Self weight of members are negligible.
4. Truss is a Perfect truss.
5. Members of truss is straight, uniform and they are two force members.

STEPS:- [Method Of Joints]

1. Check Stability, using **n=2j-3.**
2. For cantilever Truss, using **n=2j-4.**
3. Calculate the support reactions (Not necessary in cantilever truss)
4. Draw Free Body Diagram **F.B.D** of selected joints.
5. Consider Forces in members as away from the joint [Tensile]
6. At the joints forces are concurrent and each joint is in equilibrium
7. Apply Conditions of Equilibrium,

   $\Sigma F_H = 0$

   $\Sigma F_V = 0$

   $\Sigma M_A = 0$
8. Calculate Forces by **Observation** or **Inspection.**
9. Repeat the process for different joints.
10. Tabulate the Results.

SR.NO	MEMBERS	MAGNITUDE(KN)	NATURE
1.			