

UNIT I

ANALYSIS OF TRUSSES

INTRODUCTION

A structure made up of several bars (or members) riveted or welded together is known as frame.

TYPES OF FRAMES

The different types of frame are :

(i). Perfect frame and (ii) Imperfect frame.

Imperfect frame may be a deficient frame or redundant frame.

PERFECT FRAME.

The frame which is composed of such members, which are just sufficient to keep the frame in equilibrium, when the frame is supporting an external load, is known as perfect frame.

The simplest perfect frame is a triangle as shown in Fig.5.1

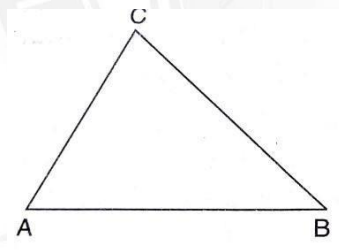


Fig.1.1

It consists of three members AB, BC and AC whereas the three joints are A,B and C. This frame can be easily analysed by the condition of equilibrium given below.

$$n = 2j - 3$$

Where n = Number of members and j = Number of joints.

IMPERFECT FRAME

A frame in which the number of members and number of joints are not given by $n = 2j - 3$ is known as imperfect frame.

DEFICIENT FRAME AND REDUNDANT FRAME

If the number of members in an imperfect frame are less than $2j - 3$, then the frame is known as deficient frame and if the number of members in an imperfect frame are more than $2j - 3$, then the frame is known as redundant frame

ASSUMPTIONS MADE IN FINDING OUT THE FORCES IN A FRAME

The assumptions made in finding out the forces in a frame are:

- (i) The frame is a perfect frame (ii) The frame carries load at the joints (iii) All the members are pin jointed.

ANALYSIS OF A FRAME

A frame is analysed by the following methods:

- (i) Method of joints,
- (ii) Method of sections,
- (iii) Tension Coefficient method and (iv) Graphical method.

