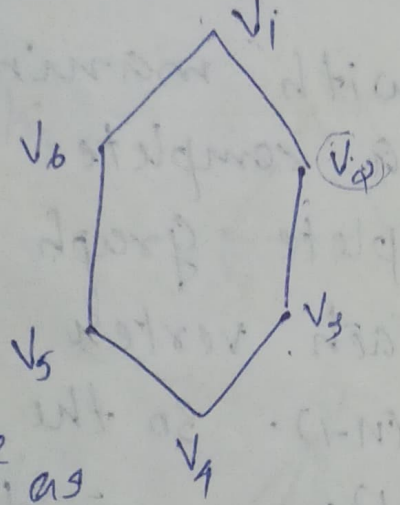
Bipartite graph [Bi graph]

A simple graph G is called bipartite if its vertex set V can be partitioned into 2 disjoint sets V_1 & V_2 such that every edge in the graph connects a vertex in V_1 & a vertex in V_2 (so that no edge in G connects either 2 vertices in V_1 or 2 vertices in V_2).

Eg. 1.

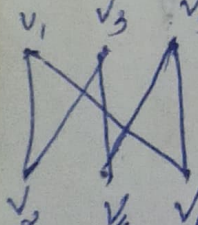


$V = \{v_1, v_2, v_3, v_4, v_5, v_6\}$

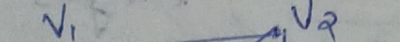
$V_1 = \{v_1, v_3, v_5\}$

$V_2 = \{v_2, v_4, v_6\}$

It can be redrawn as



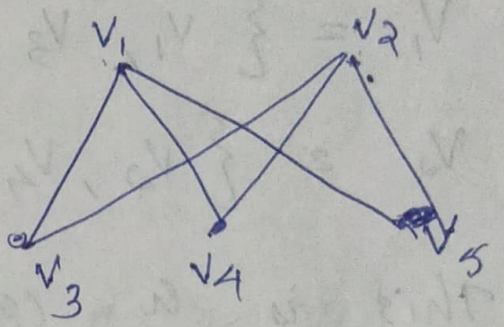
Here V can be partitioned into the 2 sets V_1 & V_2 & every edge of graph connects a vertex in V_1 & a vertex in V_2. ∴ the graph is a bipartite graph.



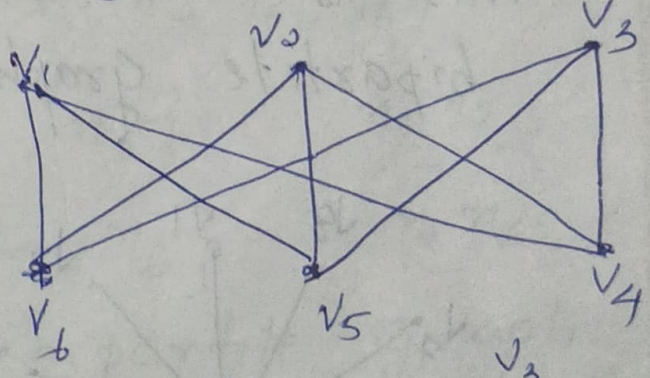
Complete Bipartite Graph

A bipartite graph in which every vertex of V_1 is adjacent to every vertex in V_2 (ie every vertex of V_1 is joined to every vertex of V_2) is called a complete bipartite graph. It is denoted by $K_{m,n}$ where 'm' is the no. of vertices in V_1 & n is the no. of vertices in V_2.

Eg. $K_{2,3}$



$K_{3,3}$



$K_{3,5}$