GRAPH THEORY

A GRAPH

A graph : is finite set of points (vertices , or nodes) . Some of which are connected by lines or arrows (edges). If the edges are undirected or "two-way" the graph is said to be undirected graph. If the edges are directed or " one-way", it is said to be a directed graph..

SOME EXAMPLES:

Example 1 : Airlines route map :a map of airlines can be represented by undirected graph. The points are cities.

Example 2 : Flow charts : it represents the flow of control in a procedure , or flow of data. The points are flow charts boxes , the connecting arrows are the flow chart arrows.

ANOTHER EXAMPLES

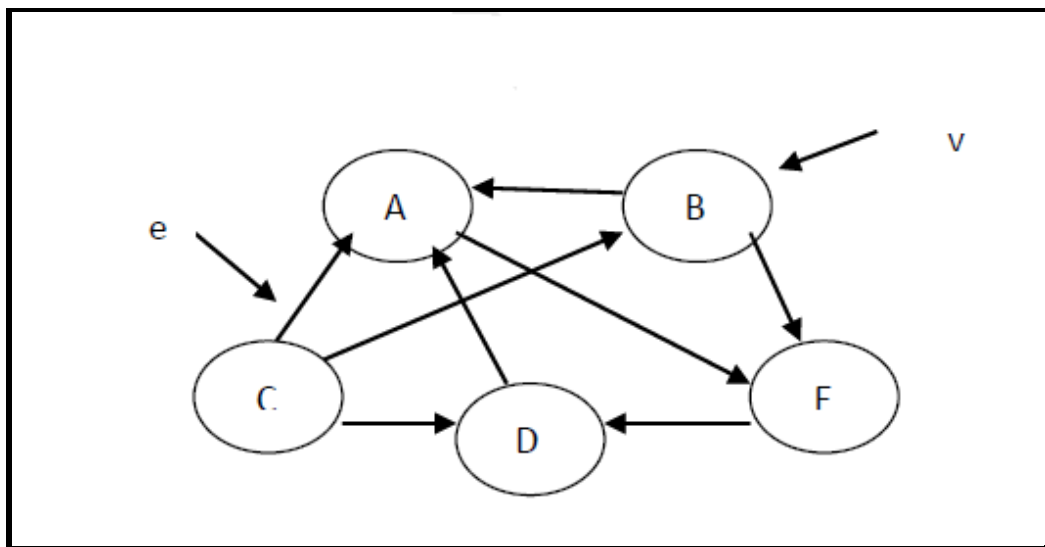Binary relations, Computer networks , an electrical circuit.
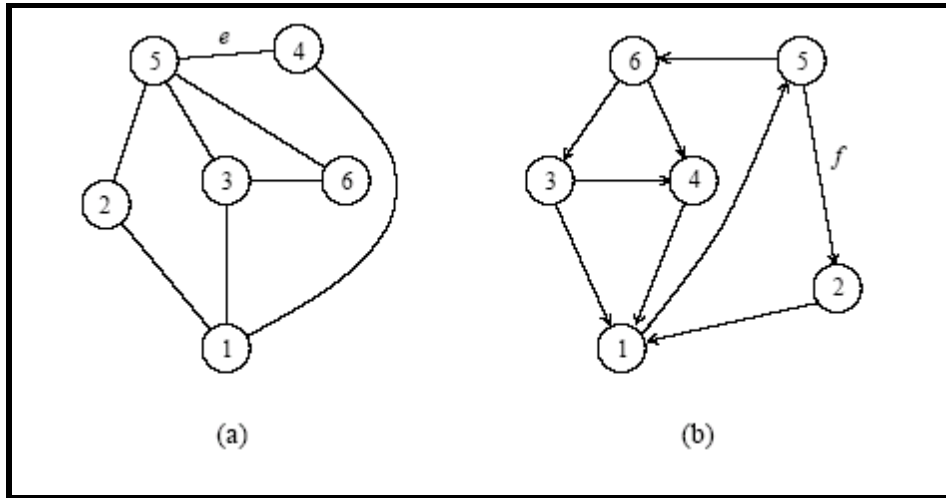

FIG (1) DIRECT GRAPH

Degree of graph: number of vertices.

Degree of vertices (node) : number of edges connected to the node (vertices).
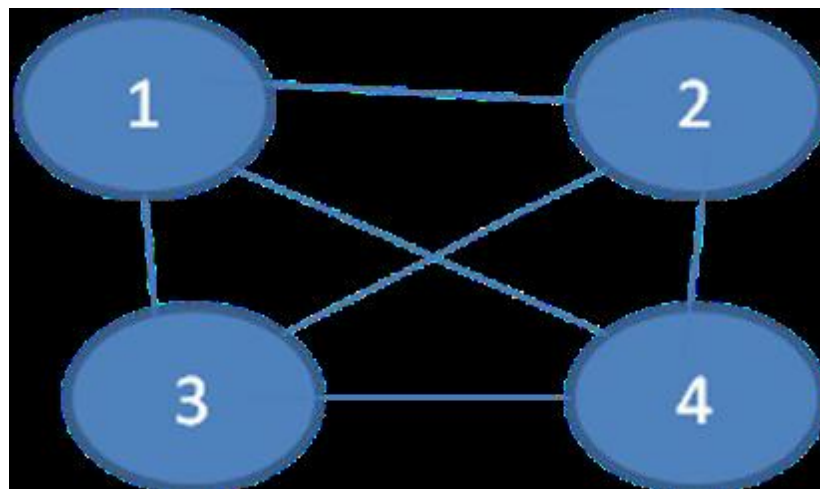
Degree (A) =4

In- degree (A) = 3

Out-degree (A)= 1

(a)   (b)

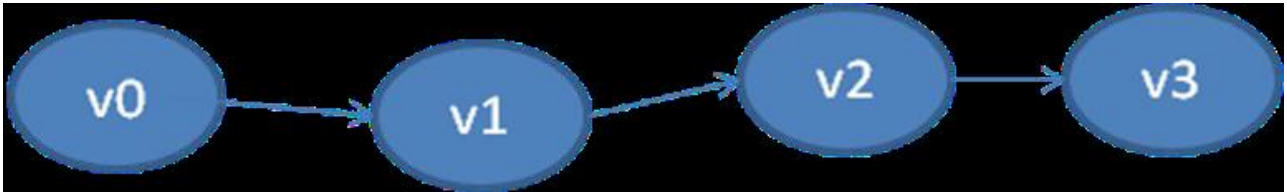**A) AN UNDIRECTED GRAPH.**   **(B) A DIRECTED GRAPH.**

A COMPLETE GRAPH: is a graph with an edge between every pair of nodes.

PATH OF GRAPH , the path from V to W is the distance ..G=(V,E) , is a sequence of edges v0, v1,v2,v3,……vx , so that v0=v , vx=w
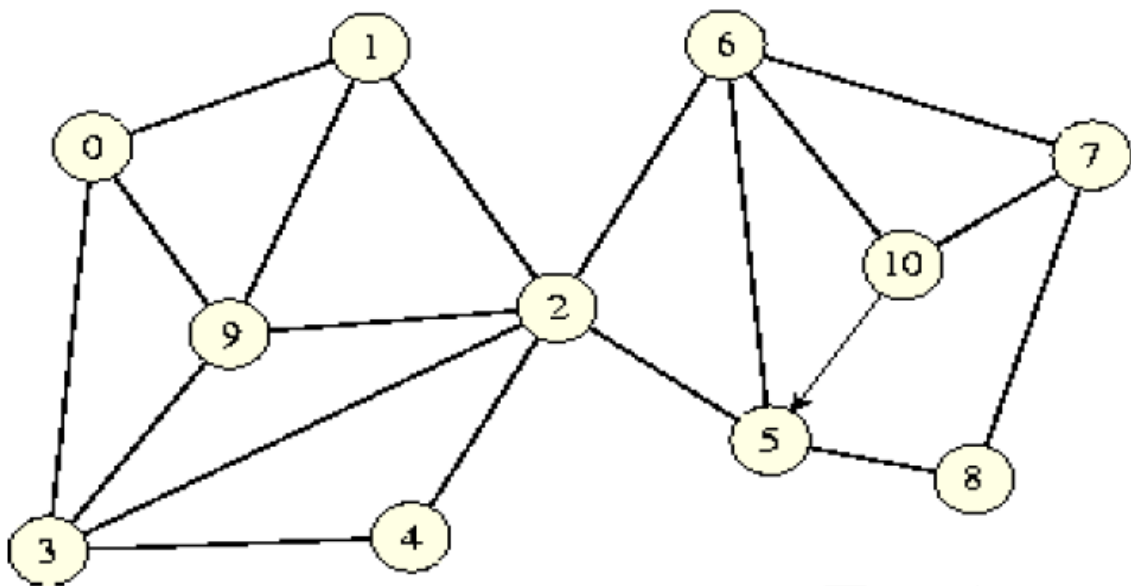
The length of a path is defined as the number of edges in the path.

Length v0 to v3 =3

Weighted graph: A graph that has weights associated with each edge.

Connected graphs: An undirected graph is connected if every pair of vertices is connected by a path.

THE GRAPH IS CONNECTED BECAUSE EACH NODE IS REACHABLE FROM EACH OTHER NODE.