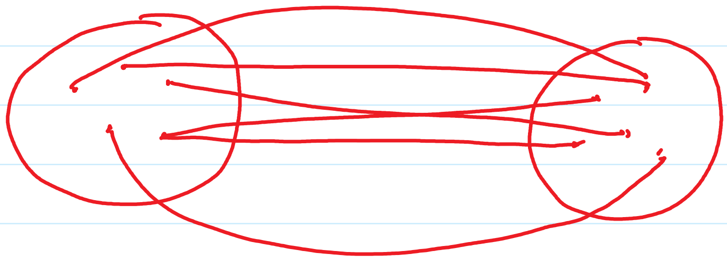
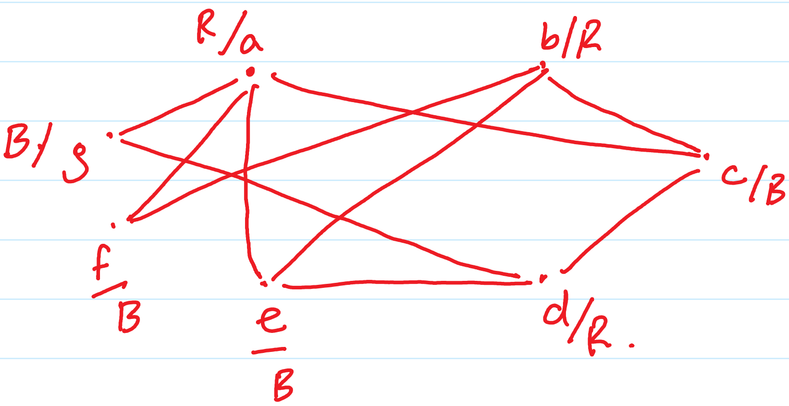
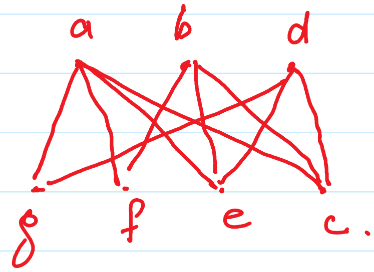
Lec 21:- Bi-partite Graph.



Ex11
P541

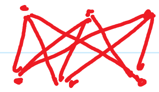


Red = {a, b, d}.
Blue = {g, f, e, c}.



Complete Bi-partite.

	$K_{m,n}$	Vertices	Edges.
$K_{1,1}$		2	1
$K_{2,1}$		3	2.
$K_{2,2}$		4	4
$K_{3,3}$		6	9

$K_{3,3}$  6 9

$\vdots$

$K_{m,n}$ $m+n$ $m \times n$.

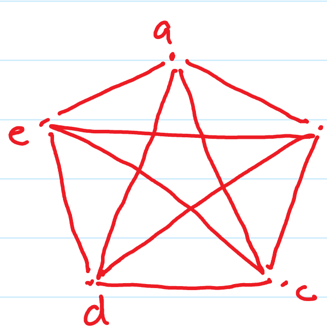
Sub Graph :- $G_1 = (V_1, E_1)$ $G_2 = (V_2, E_2)$.

G_1 is a Subgraph of G_2.

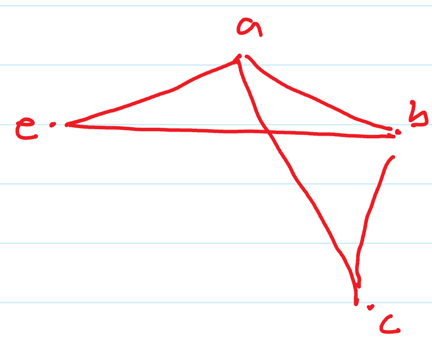
$V_1 \subseteq V_2$

$E_1 \subseteq E_2$.

P545 :-



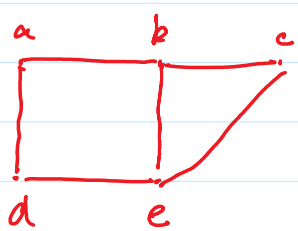
G



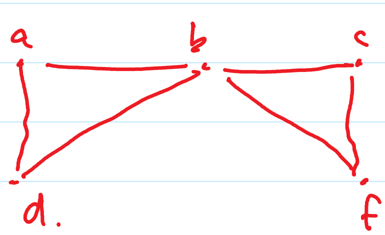
H

H is a Subgraph of G ?

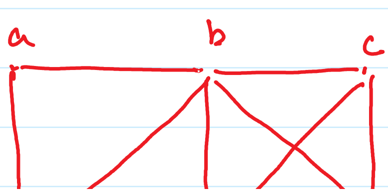
P546

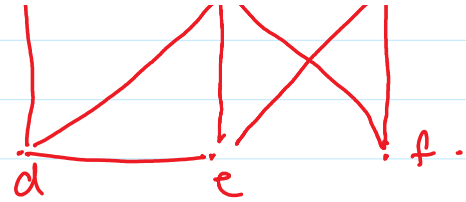


G



H

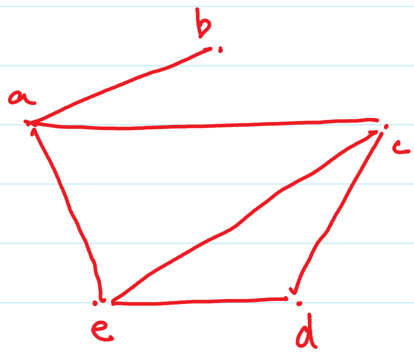




$G \cup H$

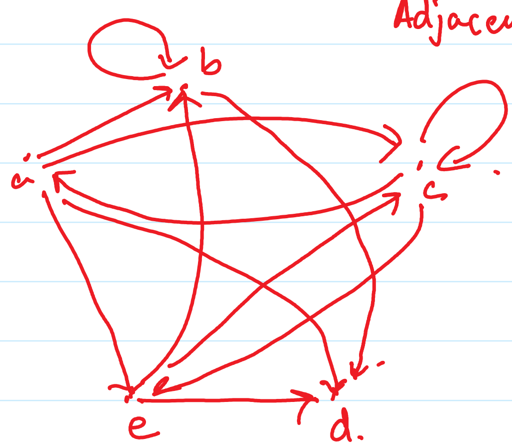
Representing Graphs.

1- Adjacency list.



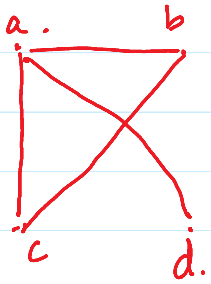
Vertex	Adjacent Vertex.
a	b, c, e
b	a
c	a, e, d
d	e, c
e	a, c, d.

Adjacency list for directed graph.



Initial Vertex	terminal Vertex.
a	b, c, e, d
b	b, d
c	a, c, e
d	—
e	b, d, c

Adjacency Matrix.

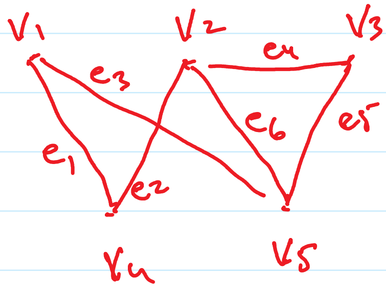


$$\begin{array}{c|cccc|c} & a & b & c & d. & \\ \hline a & 0 & 1 & 1 & 1 & 3. \\ b & 1 & 0 & 1 & 0 & 2 \\ c & 1 & 1 & 0 & 0 & 2 \\ d. & 1 & 0 & 0 & 0 & 1 \end{array}$$

Ex5
P551.

Incidence Matrix.

Ex 6
P551 :



$$\begin{array}{c|cccccc} & e_1 & e_2 & e_3 & e_4 & e_5 & e_6 \\ \hline v_1 & 1 & 0 & 1 & 0 & 0 & 0 \\ v_2 & 0 & 1 & 0 & 1 & 0 & 1 \\ v_3 & 0 & 0 & 0 & 1 & 1 & 0 \\ v_4 & 1 & 1 & 0 & 0 & 0 & 0 \\ v_5 & 0 & 0 & 1 & 0 & 1 & 1 \end{array}$$