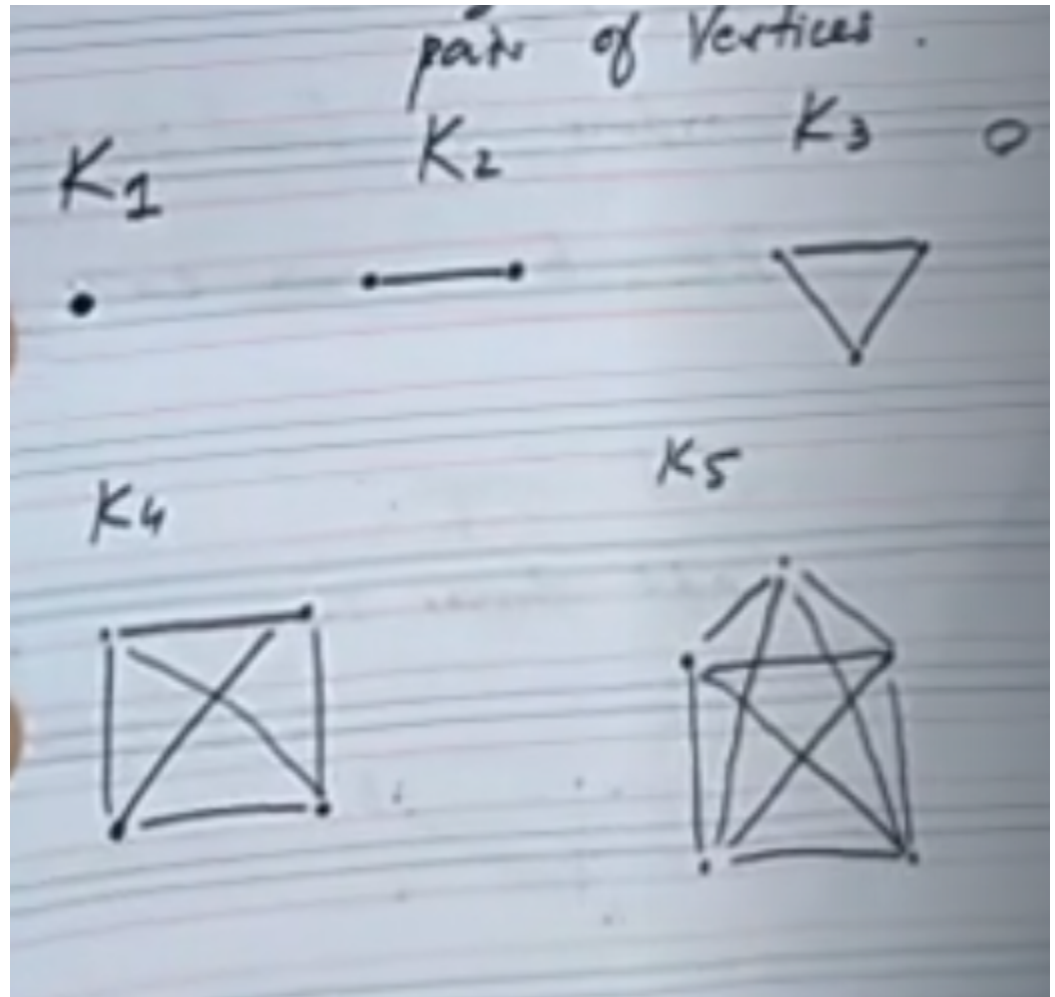# Discrete Lecture # 20 Part 2

- **Complete Graph Kn**
  - **Simple Graph**
  - **N vertices**
  - **Edge between each pair of vertices**
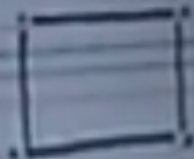 - **K-graph**

  -
- **Cycle graph**
  - **N > = 3**
  - **Simple Graph**

Cycles :- $n \geqslant 3$. Simple

C_3 C_4
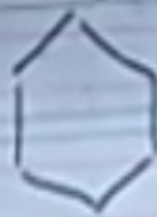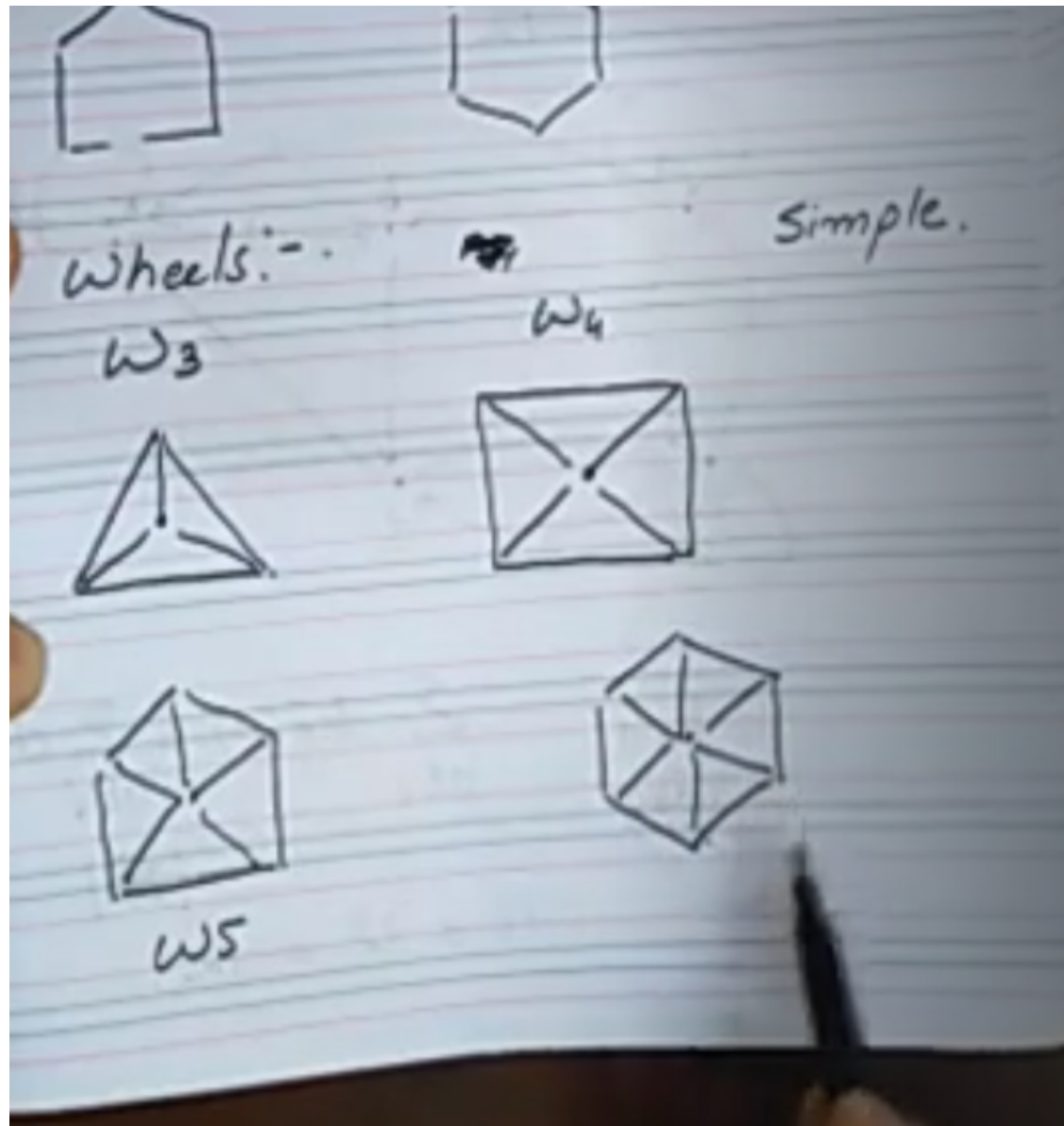

C_5 C_6

Simple

- Wheel graph

- **Cuboid Qn**
  - **We represent these with binary digits**
  - **Qn , n=1 , 2^n**
  - **Q1 , = 2^1 = 2 vertices**
  - **Q2 , = 2^2 = 4 vertices**
    - **Every Vertex will have one bit difference with their other paired vertex**
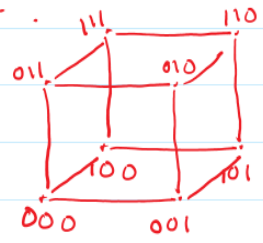
Cuboid :- Q_n 2^n Vertices. $n = 1, ----$.

Q_1. Q_2 Q_3.

○
● **Bi-Partile graph**
  ○ **A graph that can be divided into two parts**
  ○ **Set of vertices can be divided into two parts : V1 and V2 such that v1 and v2 elements do not have any edge and no link between v2 to v2 elements**
  ○ **V1 { } No link**
  ○ **V2 { } No edge**
  ○ **Vertices that are not directly connected to each other we put them separately into another group and the other into other group**
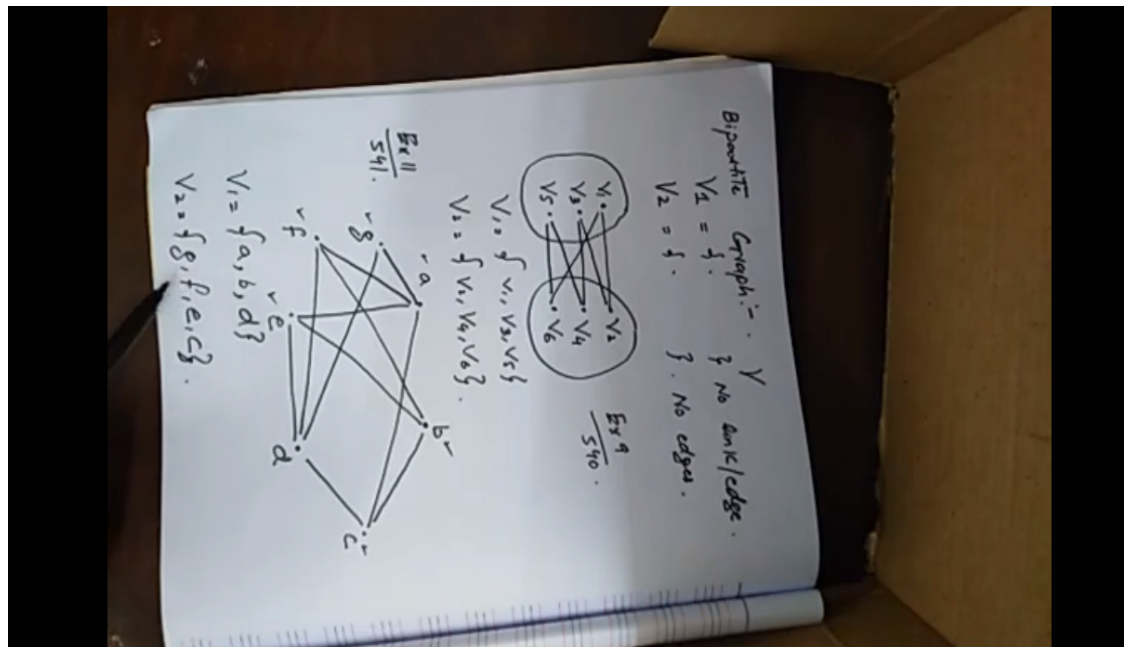
  ○
  ○ **Complete Bi-Partile Graph**

Complete bi-partite Graph.

$K_{m,n}$.

$K_{1,1}$

$K_{m,n}$.

$K_{1,2}$

$K_{2,2}$

$K_{2,3}$

$K_{3,3}$

○
○ **Sub-GRAPH**

Sub Graph:- $G = (V, E)$ $H = (W, F)$.
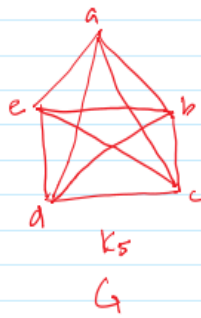
H is a Subgraph of G if $W \subseteq V \land F \subseteq E$.
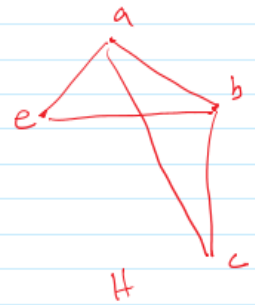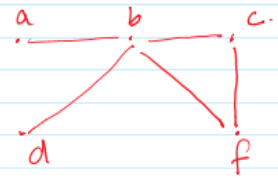
○

U V   U

$V = \{a, b, c, d, e\}$

K_5

G

H

$\frac{8 \times 17}{546}$

a   b   c   a   b   c.

d   e   d   f
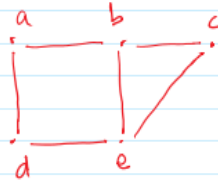
New Section 1 Page 2

d   e   d   f

G H

a   b   c

d   e   f.
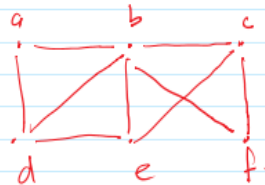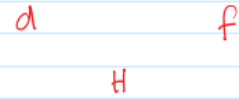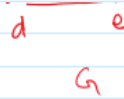
$G \cup H$.

- **Formula for Edges**

	Vertices	Edges
K_1	1	0
K_2	2	1
K_3	3	3
K_4	4	6
		10
		14
K_n	n	
	n	$\dfrac{n(n-1)}{2}$

○
- **Formula for Vertices**

	Vertices	Edges
K_1	1	0
K_2	2	1
K_3	3	3
K_4	4	6
		10
		14
K_n	n	
	n	$\dfrac{n(n-1)}{2}$

○
- **Graph Coloring**
  - In graph coloring we assign a color group to one vertex and assign another color group to its corresponding vertex with which it is linked

Ex 22 :-
54.1

R/a   R/b

B/g

f/B

c/B

e/B   d/R

Red = {a, b, d}.

Blue = {c, e, f, g}.

a   b   d

c   e   f   g