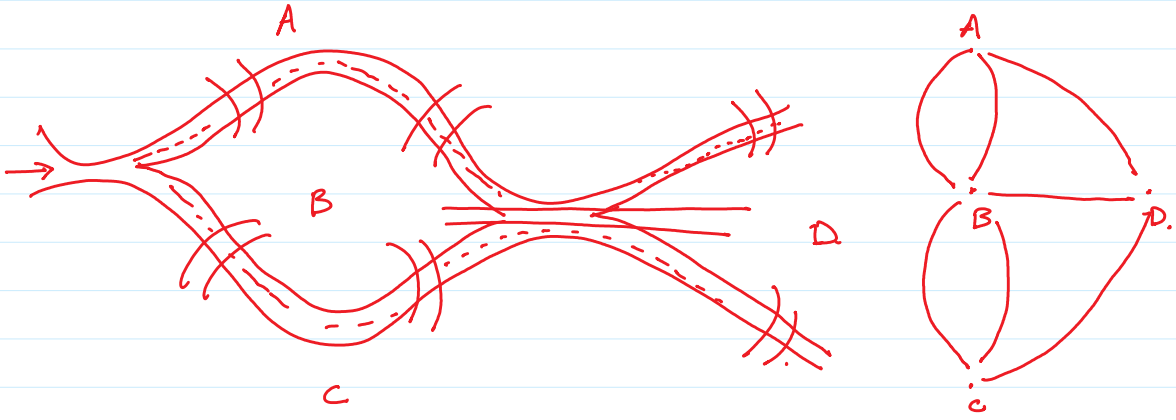
lecture 24 Sessional.

lecture 25 :- EULER PATH / CIRCUIT.

Swiss.

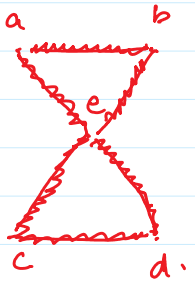
1737 Konnigsburg (Russia).



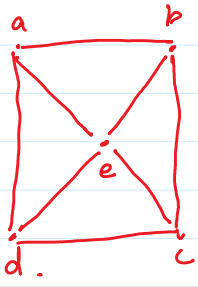
EULER PATH : if each & every edge is traversed exactly once.

EULER Circuit : if the starting & ending is the same Vertex & each and every edge is traversed exactly once.

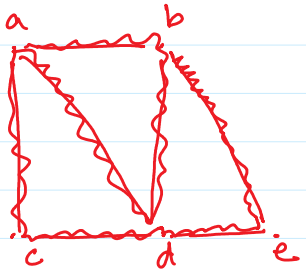
Ex. 572



EC = ✓.
EP = ✓.



EC = X
EP = X.



EC = X.
EP = ✓

Checks for Euler Paths & Circuit.

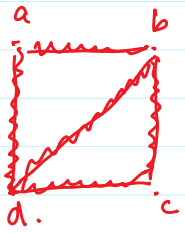
Theorem 1 :- P574 A Connected graph with atleast two Vertices has a Euler Circuit if & only if

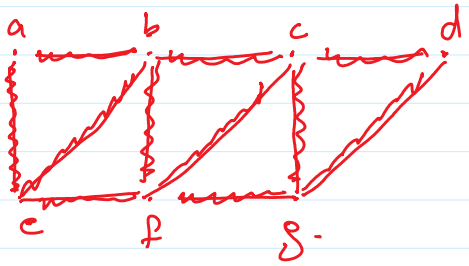
Each of its Vertex has even degree.

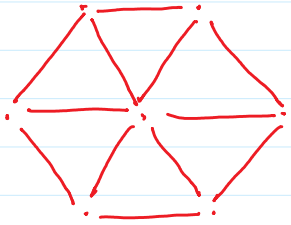
theorem 2:- A Connected graph has a EP but No EC if & if it has exactly two Vertices of odd degree.

Simple path = No Edge Repeattion.

Ex4 575

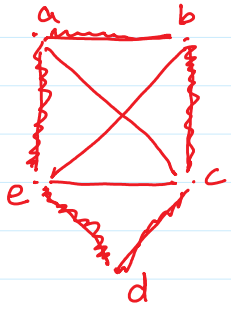




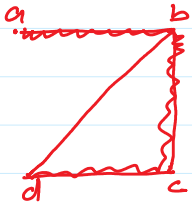


Hamilton path / Circuit.

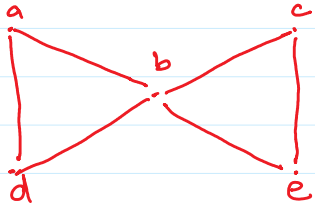
Ex5 :- 577



HP2 ✓
HC2 ✓.

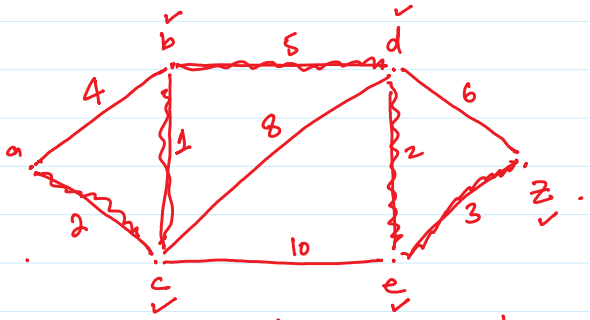


HP2 ✓
HC2 ✗.



HP2 ✓
HC2 ✗.

Shortest path (Djistra Algo).



z to a.

z e d b c a.

	a	b	c	d	e	z
	∞	∞	∞	∞	∞	∞
z	∞	∞	∞	6_z	3_z	0_z
e	∞	∞	13_e	5_e	3_z	10_z
d	∞	10_d	13_e	5_e	3_z	10_z
b	14_b	10_d	11_b	5_e	3_z	10_z
c	13_c					

Session II.

Q1) $R = \{(a,b) \mid a-b \in \mathbb{Z}^+\}$

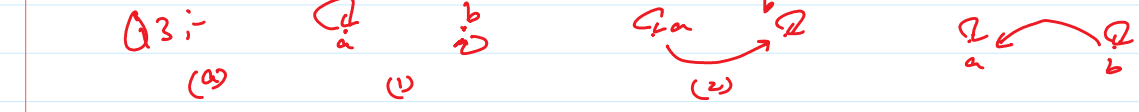
$[\frac{1}{2}] = \{\pm\frac{1}{2}, \pm\frac{3}{2}, \pm\frac{5}{2}, \dots\}$.

Q2) :- $\{(1,4),(4,1),(3,3),(1,2)\}$. $A = \{1,2,3,4\}$.

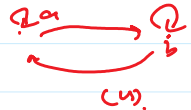
Reflexive. $\{(1,1),(2,2),(3,3),(4,4),(1,4),(4,1),(1,2)\}$.

Symmetric $\{(1,4),(4,1),(3,3),(1,2),(2,1)\}$.

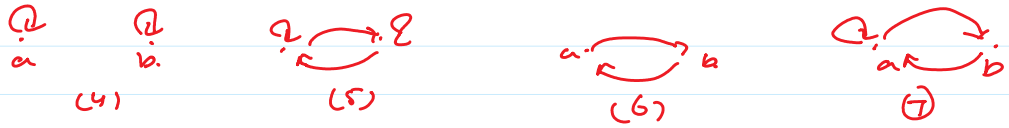
Q3 :-

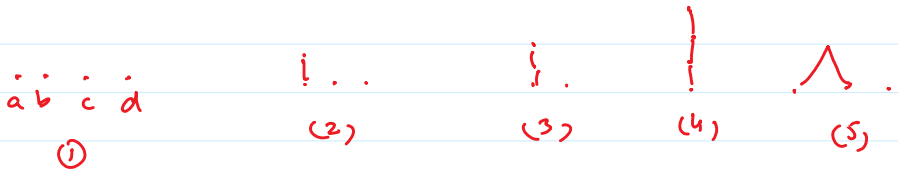


Reflexive.



Symmetric :



4) 

16 elements.

5) $R = \{(a,b) \mid a \cap b = b \cap a\}$ $A = \{\{a\}, \{b\}, \{a,b\}, \{a,c\}\}$

16 elements.

6) $R = \{(a,b) \mid a \cap b = \Phi\}$ $A = \{x, y\}$

$P(A) = \{\Phi, \{x\}, \{y\}, \{x,y\}\}$.

9 elements.