Lecture 35

16 November 2021 11:29

How to Evaluate Prefix and Postfix expressions

- Prefix expression is evaluated by working from right to left. When an operator is encountered, we perform the corresponding operation with the two operands immediately to the right of this operand.

Q18. What is the value of these prefix expressions?

(i)

↑ − * 3 3 * 4 2 5

↑ − * 3 3 8 5

↑ − 9 8 5 = ↑ 1 5 = 1

(ii)

+ − ↑ 3 2 ↑ 2 3 / 6 − 4 2

+ − ↑ 3 2 ↑ 2 3 / 6 2

+ − ↑ 3 2 ↑ 2 3 3

+ − ↑ 3 2 8 3 = + − 9 8 3

= + 1 3 = 4

- Postfix expression is evaluated by working from left to right. When an operator is encountered, we perform the corresponding operation with the two operands immediately to the left of this operand.

Q18. What is the value of these postfix expressions?

(i)

5 2 1 − − 3 1 4 + + *

51-314++x = 4314++x

= 435+*

= 48* = 32

(ii)

32*2↑53-84/*-

62↑53-84/*-

36 53-84/*-

36 2 84 /*- = 36 22*-

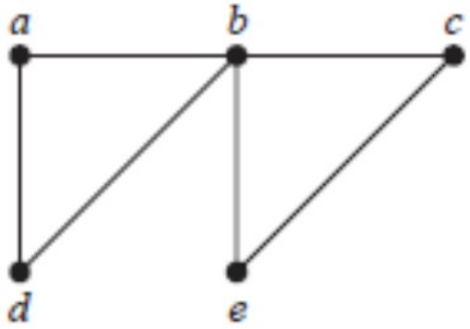
= 36 4-

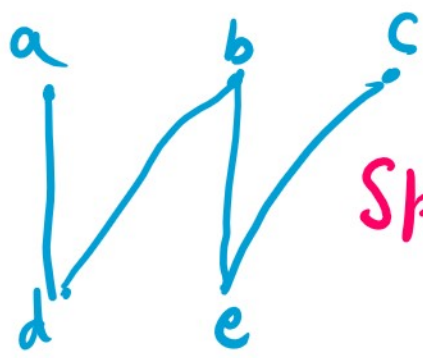
= 32

Spanning Tree

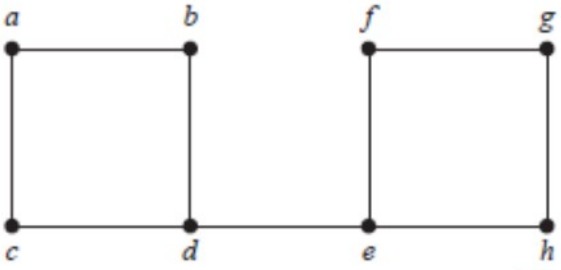
Let G be a simple graph. A *spanning tree* of G is a subgraph of G that is a tree containing every vertex of G.

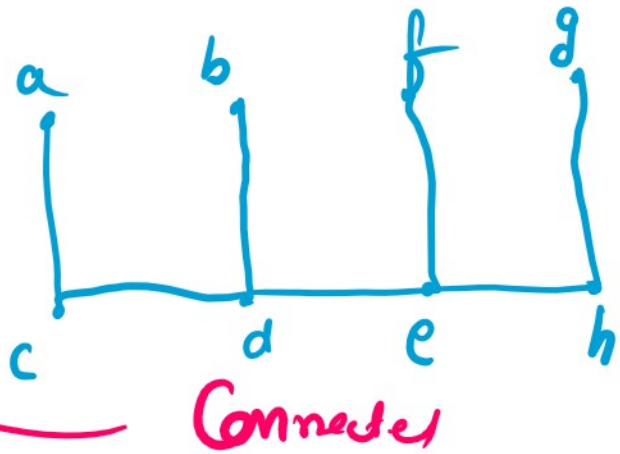
Connected, Simple, No circuit.





Spanning Tree of T.





Connected

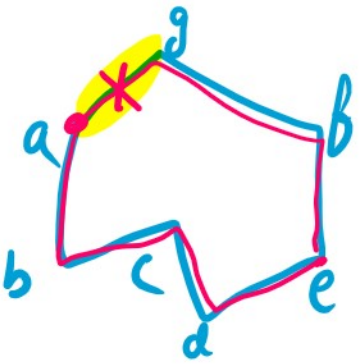
Theorem 6:

A simple graph is connected if and only if it has a spanning tree.

Spanning Tree → Connected

Connected
- Tree → S.T.
- Not Tree → Some circuits → Remove edge → Spanning Tree

Spanning Tree



- **Spanning tree of Graph with n vertices contains** $n-1$ **edges.**

- **No. of edges to be removed from connected graph with n vertices and e edges to produce a spanning tree is** $e-(n-1)=e-n+1$

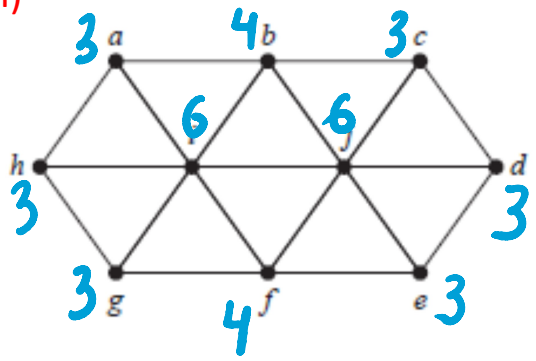
Q19. How many edges needs to be removed to form a spanning tree.

(i)

3 a 4 b 3 c

vertices = 10, $e = \frac{18+8+12}{2}$

(i)



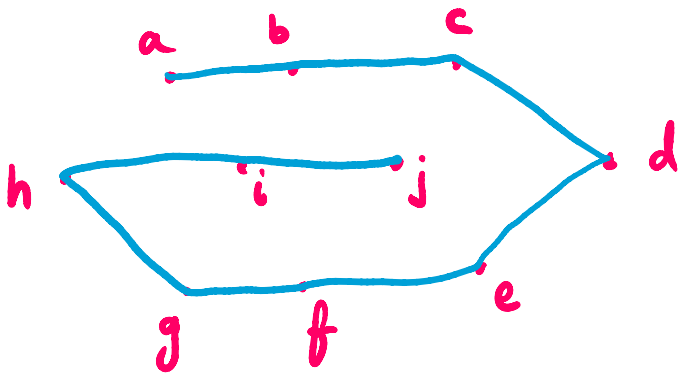
vertices = 10, $e = \frac{18+8+10}{2}$

Tree has edges = 9

Removed = $e - 9$

$= 19 - 9$

$= 10$



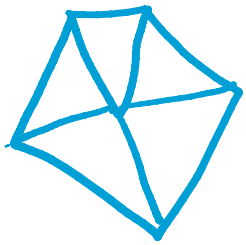
(ii) $K_{4,4}$

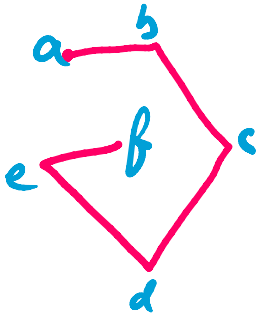
$v = 8, \; e = 16$

To be removed = $16 - (7) = 9$

(iii) W_5

(A) 6 (B) 5 (C) 7 (D) 4





$v = 6, \; e = 10$

$10 - (6-1) = 5$

Exercise: Write general formula for K_n, C_n, W_n, $K_{m,n}$

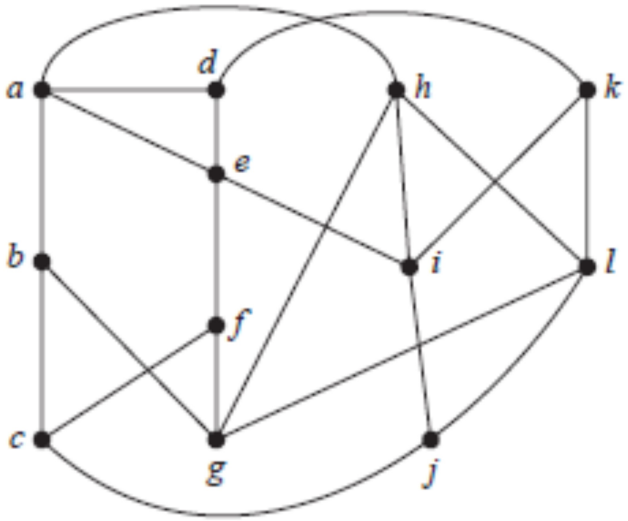
Q20. Find spanning tree of the following graph by removing edges in simple circuits.

(i)

Edges in Tree = 11

(i)

(i) $V = 12$



Edges in Tree = 11