

G.H. Raisoni College of Engg, Nagpur

2020-2021 ODD TERM

CPE-2 EXAMINATION FOR SPLIT-II COURSES

WINTER-2020

DEPARTMENT: ARTIFICIAL INTELLIGENCE

SEM/SEC: 3/A

DATE: 27/08/2020

SUBJECT: ~~DATA~~ DATA STRUCTURE & ALGORITHMS

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Q3.

a.

B-Tree	Binary Tree
(1) B-Tree is known as self-balancing tree as its nodes are sorted in inorder traversal.	The Binary tree is a tree structure which can have at most two pointers for its child node.
(2) Have maximum 'M' no. of child nodes.	Have maximum two child nodes.

Shivam Tawari

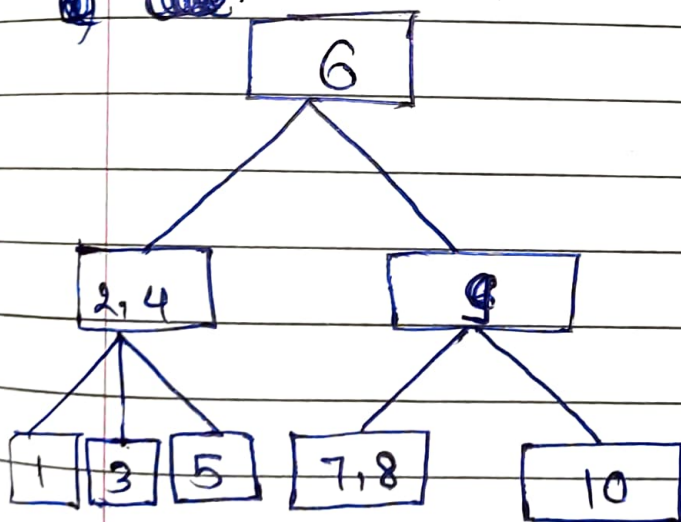
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③ Performed when the data is loaded in disk.

④ Used in code indexing.

⑤ Data insertion is more complicated.

Diagram:



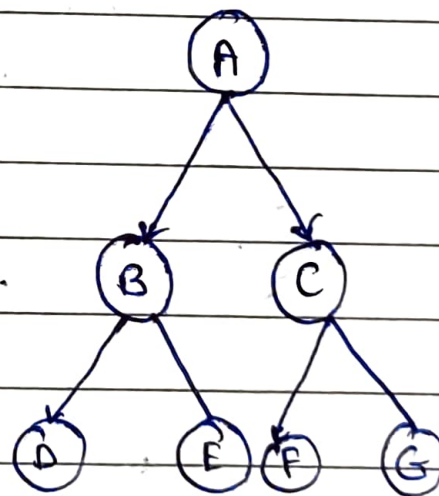
B-Tree

Performed when the data is loaded in RAM.

Used in code optimization and Huffman coding.

Data insertion is less complicated than B-Tree.

Diagram:



Binary Tree

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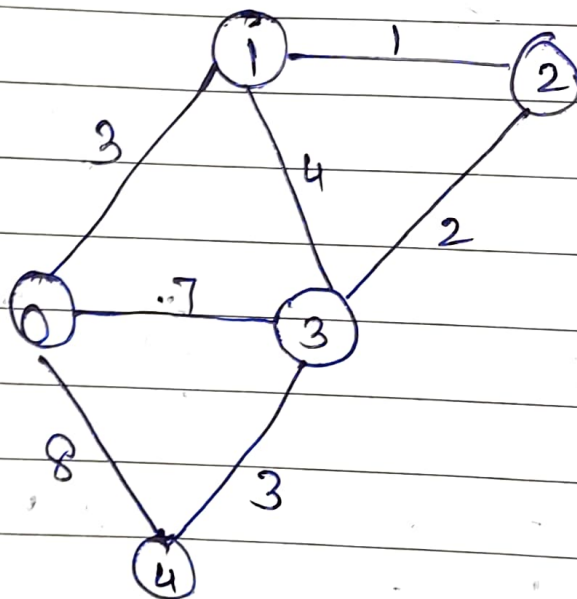
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b.

i.) Weighted Graph:

A weighted graph refers to a simple graph that has weighted edges. These weighted edges can be used to compute the shortest path.

Weighted graphs may be either directed or undirected. The weight of an edge is often called as 'cost' of the edge.



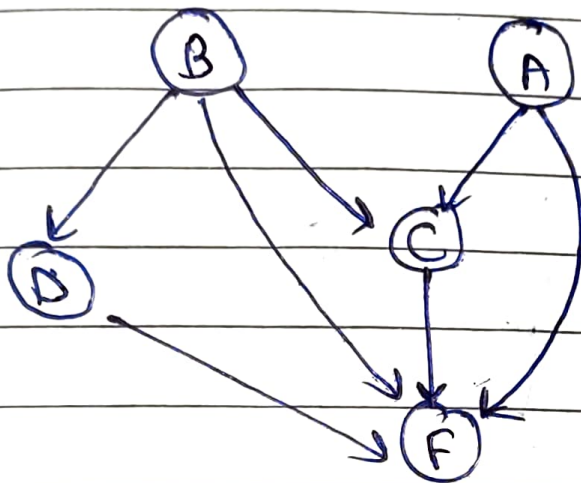
Weighted Graphs

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ii) Directed Acyclic Graph (DAG):

A directed acyclic graph is a graph that is directed and without cycles connecting the other edges. The edges of the directed graph only go one way. ~~It is a~~



Directed Acyclic Graph

Q4.

- a. ~~Kruskal's~~ Kruskal's algorithm is a minimum spanning tree algorithm that takes a graph as input and finds the subset of the edges of that graph which:

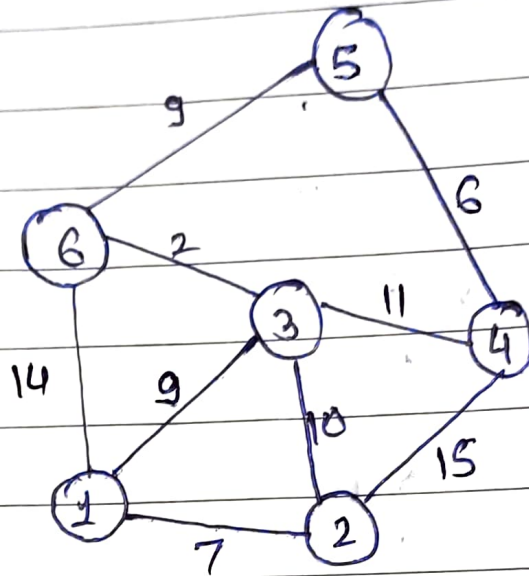
* Form a tree that includes every vertex.

~~Answer~~

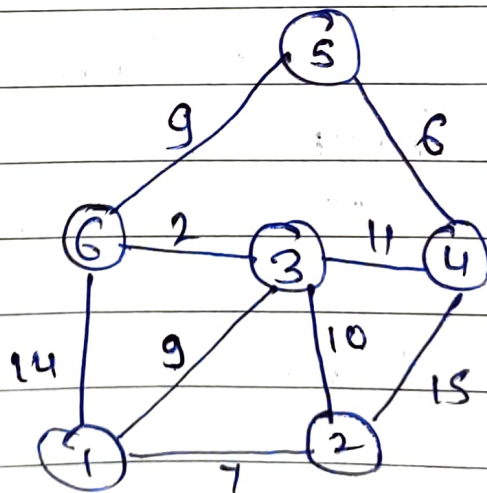
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- ★ has the minimum sum of weights among all the trees that can be formed from the graph.

Given Graph:



Step 1: Remove all parallel edges and self loops



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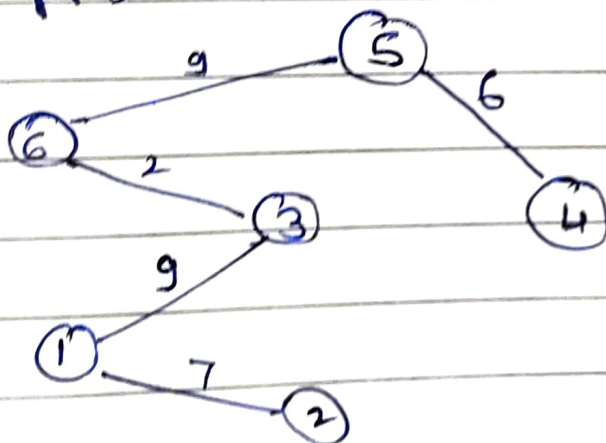
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Step 2: Sort all the edges in non-decreasing order.

Weight	Edge
2	2-6
6	4-5
7	1-2
9	1-3
9	5-6
10	2-3
11	3-4
14	1-6
18	2-4

Step 3: Pick the smallest edge and check if it forms a cycle, if there is a cycle then discard it and pick next smallest edge.

Final Graph:



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