MANIPAL UNIVERSITY
JAIPUR
(University under Section 2(f) of the UGC Act)

FIRST STATE PRIVATE UNIVERSITY IN RAJASTHAN
A+ NAAC
3.28 SCORE

B.TECH. SECOND YEAR

(III SEM. CSE/IT/CCE)

ACADEMIC YEAR: 2020-2021

COURSE NAME: ENGINEERING MATHEMATICS III

COURSE CODE : MA 2101

LECTURE SERIES NO : UNIT-III (LECTURE NO. 14- 22)

CREDITS : 3

MODE OF DELIVERY : ONLINE (POWER POINT PRESENTATION)

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PROPOSED DATE OF DELIVERY: August 17, 2020

MANIPAL UNIVERSITY
JAIPUR

VISION

Global Leadership in Higher Education and Human Development

MISSION

- Be the most preferred University for innovative and interdisciplinary learning
- Foster academic, research and professional excellence in all domains
- Transform young minds into competent professionals with good human values

VALUES

Integrity, Transparency, Quality,
Team Work, Execution with Passion, Humane Touch

SESSION OUTCOME

"TO UNDERSTAND THE CONCEPT OF TREES AND APPLY THE TREE ALGORITHMS TO ANALYZE THE SHORTEST PATH PROBLEMS"

ASSIGNMENT

QUIZ

MID TERM EXAMINATION –I & II

END TERM EXAMINATION

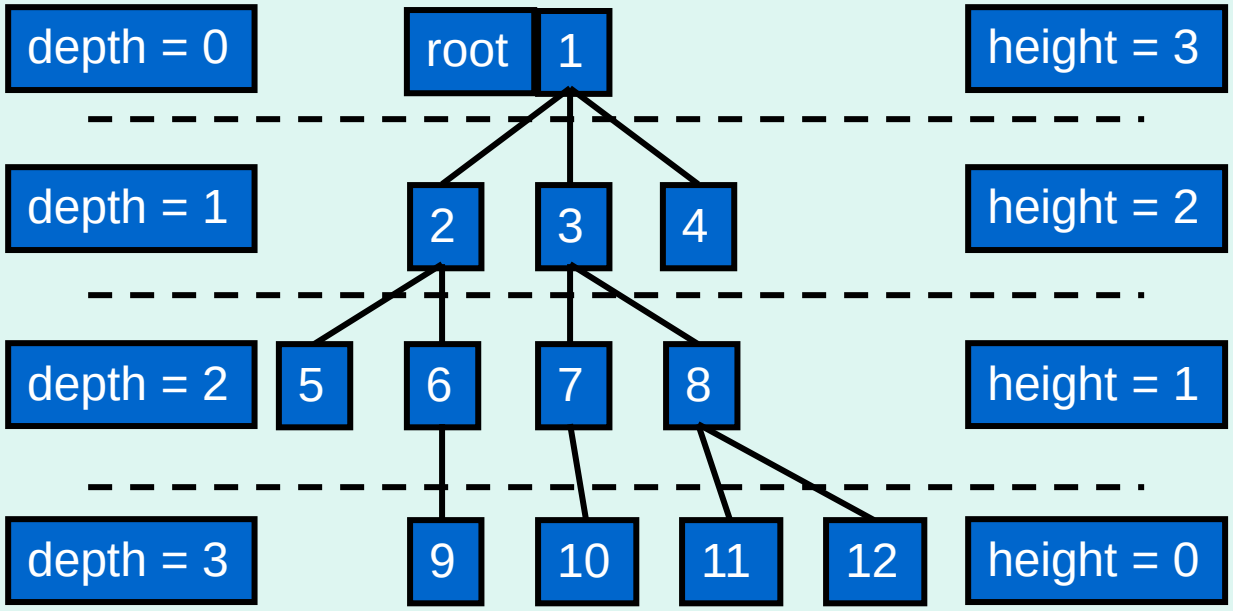
ASSESSMENT CRITERIA

PROGRAM OUTCOMES MAPPING WITH CO3

PO1

ENGINEERING KNOWLEDGE: APPLY THE KNOWLEDGE OF MATHEMATICS, SCIENCE, ENGINEERING FUNDAMENTALS, AND AN ENGINEERING SPECIALIZATION TO THE SOLUTION OF COMPLEX ENGINEERING PROBLEMS.

A Rooted Tree



Level of a vertex and tree height

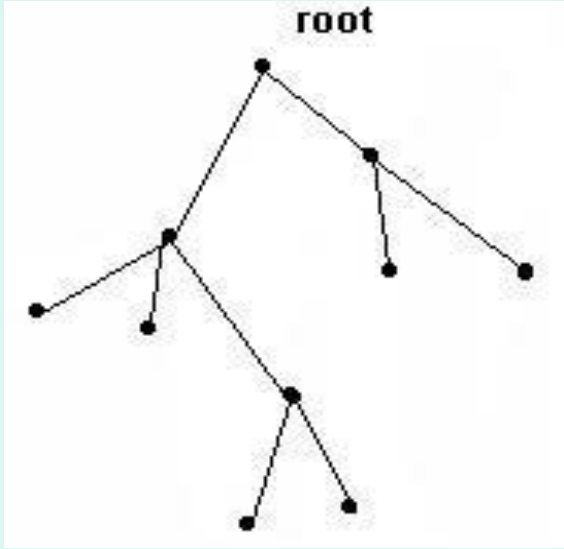
Let T be a rooted tree:

- The *level l(v)* of a vertex **v** is the length of the simple path from **v** to the root of the tree
- The *height h* of a rooted tree T is the maximum of all level numbers of its vertices:

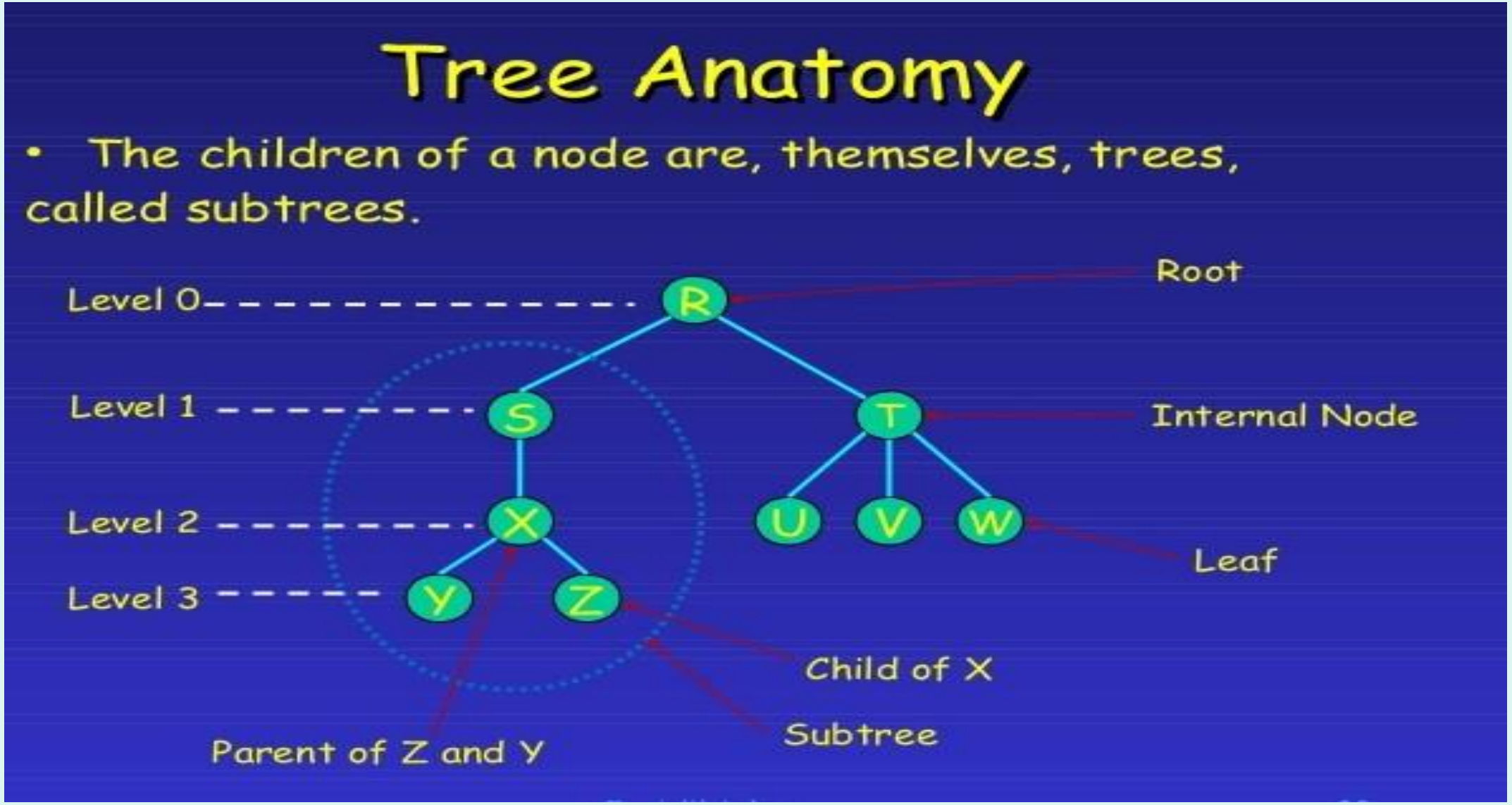
$$h = \max_{v \in V(T)} \{ l(v) \}$$

Example:

the tree on the right has height 3



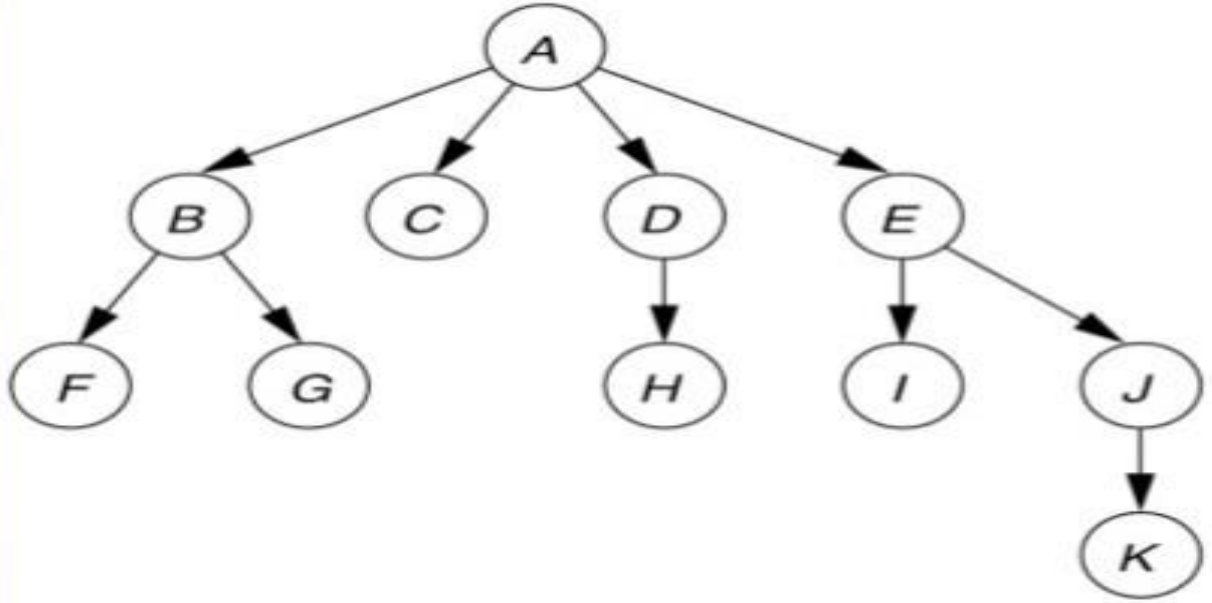
Tree Anatomy



Tree Anatomy

Figure

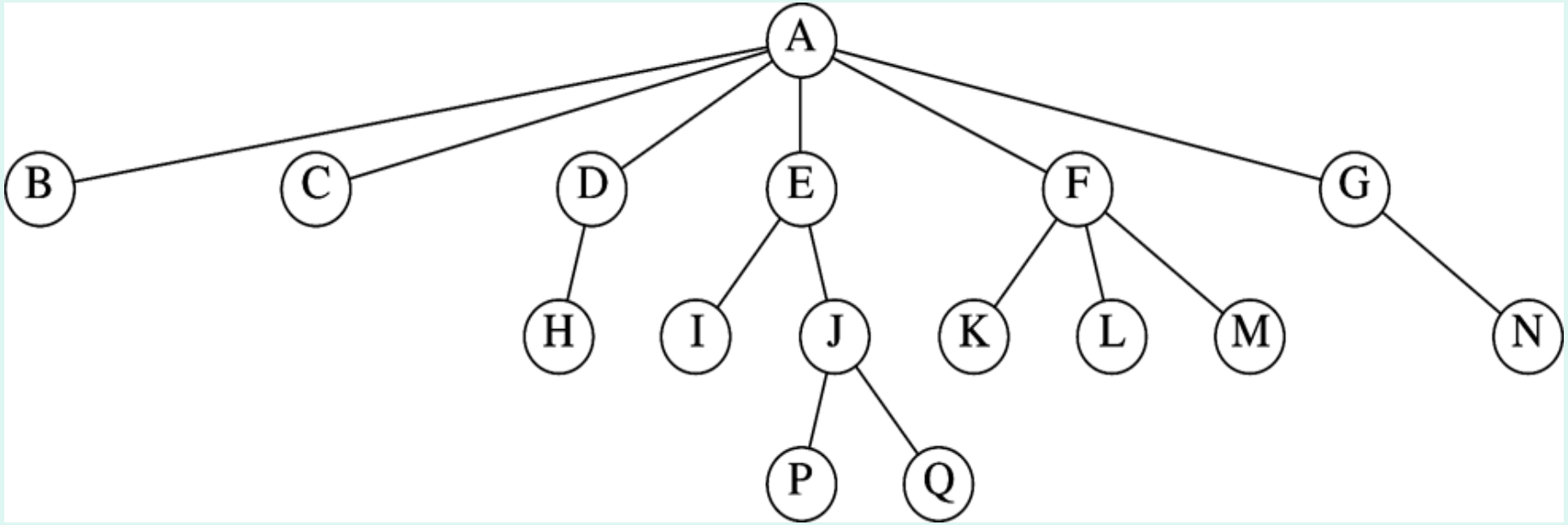
A tree, with height and depth information



Node	Height	Depth
A	3	0
B	1	1
C	0	1
D	1	1
E	2	1
F	0	2
G	0	2
H	0	2
I	0	2
J	1	2
K	0	3

Problems based on Rooted Tree

- Which are the parent nodes?
- Which are the child nodes?
- Which are the leaves?
- What is the height and depth of the tree?
- What is the height and depth of node *E?* Node *F?*



m-ary Tree

A rooted tree is called an *m-ary tree* if every internal vertex has at most *m* children. The tree is called a *full m-ary tree* if every internal vertex has exactly *m* children. An *m*-ary tree with *m*=2 is called a *binary tree*.

•A full *m*-ary tree with *i* internal vertices contains $n = mi+1$ vertices.