Week 8 Multiple-Choice

1. Which of these approaches are commonly used to store graph data?

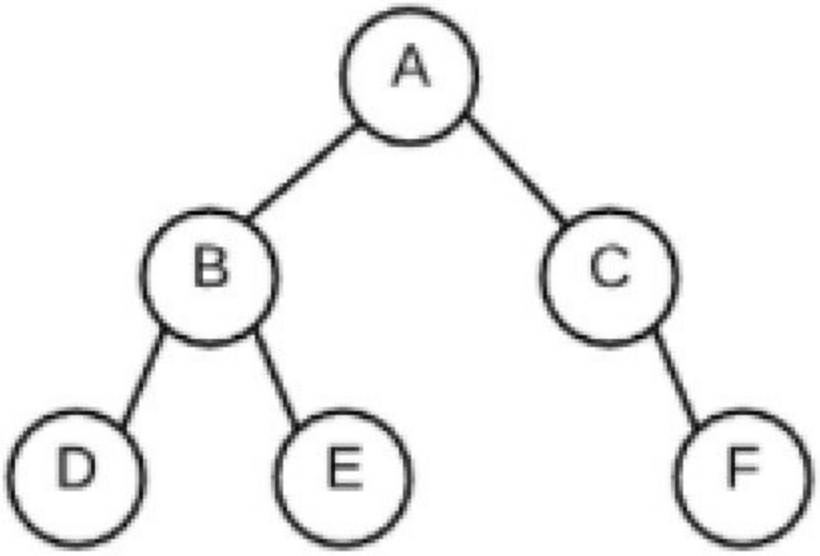
[ ] Adjacency Pool
[ ] Object Orientation
[ ] Adjacency Matrix
[ ] Adjacency List

2. What is the only node for a binary (or any) tree that does not have a parent node?

[ ] A sibling node
[ ] A subtree node
[ ] A leaf node
[ ] A root node

3. TCP connections provide two important needs for computer-to-computer communications. Choose them from the following list.

[ ] Reliable data transfer
[ ] Persistent & consistent connections
[ ] Ethernet protocol management
[ ] MAC addresses



4. How many leaf nodes are in the image of the tree?

[ ] 5
[ ] 1
[ ] 4
[ ] 2
[ ] 3

5. The first four bits of an IPv6 packet's header is the version number that translates to "6". Which of the following binary representations represents the number 6?

[ ] 1010
[ ] 0110
[ ] 0101
[ ] 1100

6. The first four bits of an IPv4 packet's header is the version number that translates to "4". Which of the following binary representations represents the number 4?

[ ] 0001
[ ] 0010
[ ] 1000
[ ] 0100

7. In a binary search tree, which of the following depth-first tree traversal methods would result in retrieving the nodes in *ascending sorted order*?

[ ] Min-max-order
[ ] Post-order
[ ] Pre-order
[ ] In-order

8. Assuming that a *binary* tree has four nodes, what is the *minimum* number of leaf nodes the tree could have?

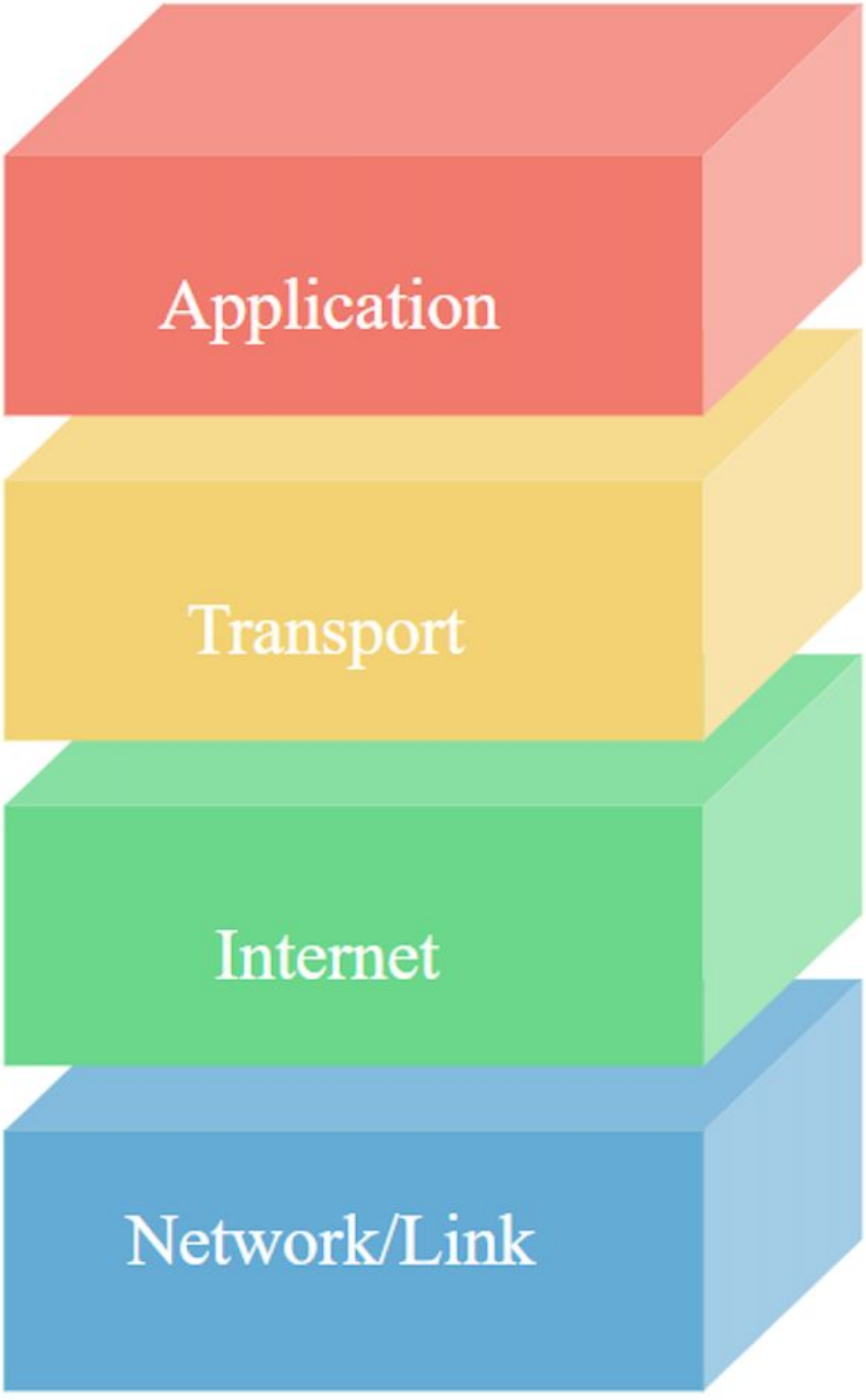
[ ] 3
[ ] 4
[ ] 1
[ ] 2

9. Choose the following conditions that MUST be met for a binary tree to be a binary tree. (*multi-select*)

[ ] The left subtree is a binary search tree
[ ] The left subtree contains values less than the root
[ ] The right subtree is a binary search tree
[ ] The right subtree contains values greater than or equal to the root

10. What are the two major classifications of tree traversal that you learned about in this material?

[ ] Up-down traversal
[ ] Breadth-first traversal
[ ] Depth-first traversal
[ ] Width-first traversal


Application
Transport
Internet
Network/Link

11. What protocol does the above image model?

[ ] MAC
[ ] HTTP
[ ] OSI
[ ] TCP/IP

12. Assuming that a binary (or any) tree is not empty, what is the least number of parent nodes that a binary tree can have?

[ ] 1
[ ] 3
[ ] 2
[ ] 0

13. What type of search would you use to determine the shortest distance between two people in a social network?

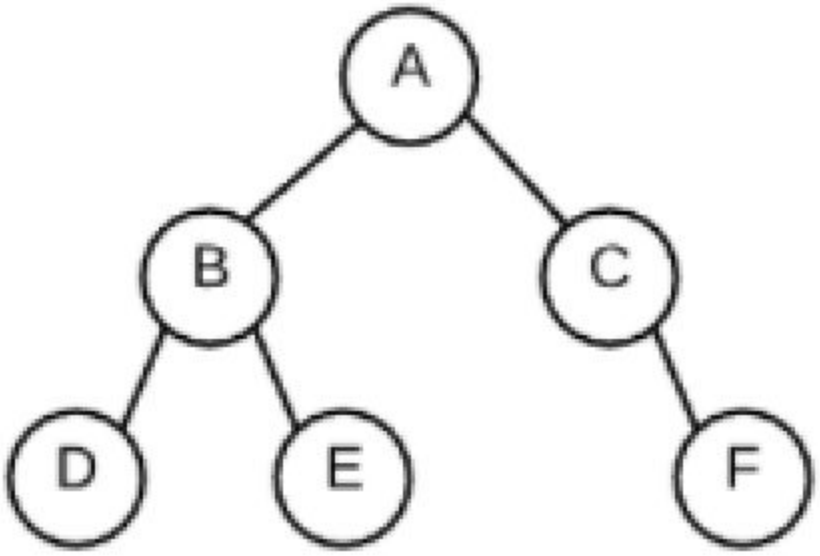
[ ] A breadth-first search
[ ] A cyclic search
[ ] A relationship search
[ ] A depth-first search

14. Assuming that a *binary* tree has four nodes, what is the *maximum* number of leaf nodes the tree could have?

[ ] 3
[ ] 2
[ ] 1
[ ] 4

15. In the Domain Name Service (DNS), which one of the following record types indicates the server that can handle email traffic?

[ ] An SOA record
[ ] An MX record
[ ] An A record
[ ] An NS record



16. How many nodes the tree in the image have?

[ ] 6
[ ] 5
[ ] 8
[ ] 7
[ ] 4

17. Of the following features, which ones can a graph have but a tree cannot?

[ ] A graph can have leaf nodes but a tree cannot have leaf nodes
[ ] A graph can have cycles but a tree cannot
[ ] A graph can have no root node but a tree must have a root
[ ] A graph can have only one node but a tree must have more than one node

18. In the Domain Name Service (DNS), which one of the following record types maps a domain name such as "appacademy.io" directly to an IP address?

[ ] A CNAME record
[ ] An SOA record
[ ] An A record
[ ] An NS record

Key

1. Adjacency Matrix & Adjacency List
1. A root node
1. Reliable data transfer & Ethernet protocol management (this answer is questionable - do further reading to confirm)
1. 3
1. 0110
1. 0100
1. Pre-order
1. 1
1. ALL ANSWERS
1. Breadth- & Depth-first traversal
1. TCP/IP
1. 0
1. A breadth-first search
1. 2
1. An MX record
1. 6
1. A graph can have cycles but a tree cannot & a graph can have no root node but a tree must have a root
1. An A record