Sub: DSU MCQ on Unit-5 Trees & Graphs
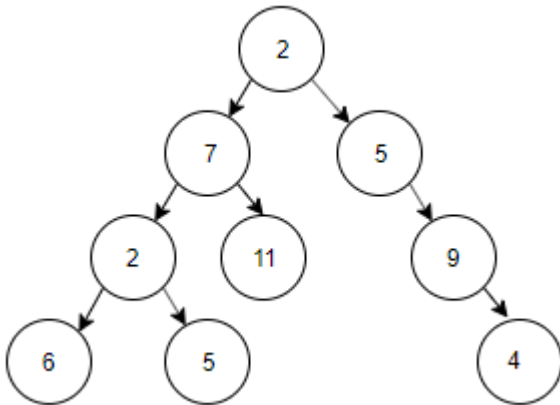
1. For the tree below, write the in-order traversal.

a) 6, 2, 5, 7, 11, 2, 5, 9, 4
b) 6, 5, 2, 11, 7, 4, 9, 5, 2
c) 2, 7, 2, 6, 5, 11, 5, 9, 4
d) 2, 7, 6, 5, 11, 2, 9, 5, 4

2. A _____ tree is tree where for each parent node, there is only one associated child node

A. balanced binary tree

B. rooted complete binary tree

C. complete binary tree

D. degenerate tree

3. What is the space complexity of the in-order traversal in the recursive fashion? (d is the tree depth and n is the number of nodes)
a) O(1)
b) O(nlogd)
c) O(logd)
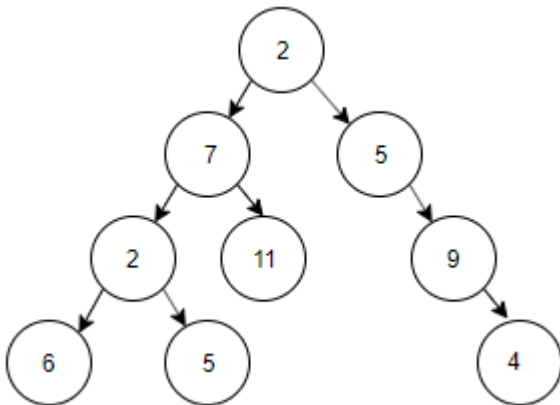**d) O(d)**

4. A tree cannot contain cycles

A. False

B. True

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5. In graphs, A hyperedge is an edge that is allowed to take on any number of _____

A. Vertices

B. **Edges**

C. Both a and b above

D. Labels

6. For the tree below, write the level-order traversal.

a) 2, 7, 2, 6, 5, 11, 5, 9, 4
b) 2, 7, 5, 2, 11, 9, 6, 5, 4
c) 2, 5, 11, 6, 7, 4, 9, 5, 2
d) 2, 7, 5, 6, 11, 2, 5, 4, 9

7. Breadth First Search is used in

A. Binary trees

B. Stacks

C. **Graphs**

D. Both a and c above

8. Which of the following ways below is a pre order traversal?

A. **Root->left sub tree->right sub tree**

B. Root-> right sub tree ->left sub tree

C. right sub tree->left sub tree->Root

D. left sub tree->right sub tree->Root

9. What is the pecularity of red blac trees?

A. In red-black trees, the root do not contain data.

B. In red-black trees, the leaf nodes are not relevant and do not contain data.

C. In red-black trees, the leaf node are relevant but do not contain data.

D. Both a and c above

10. AVL trees have a faster _____

A. Insertion

B. Deletion

C. Updation

D. Retrival

11. Which of the following statements hold true for binary trees?

A. The left subtree of a node contains only nodes with keys less than the node's key

B. The right subtree of a node contains only one nodes with key greater than the node's key.

C. Both a and b above

D. Noth left and right subtree nodes contains only nodes with keys less than the node's key

12. Which of the following linked list below have last node of the list pointing to the first node?

A. circular doubly linked list

B. circular linked list

C. circular singly linked list

D. doubly linked list

13. Which of the following ways below is a In order traversal?

A. Root->left sub tree->right sub tree

B. Root-> right sub tree ->left sub tree

C. right sub tree->left sub tree->Root

D. left sub tree->right sub tree->Root

14. Can stack be describe as a pointer?

A. Yes

B. No

Que.18. The time required in best case for search operation in binary tree is

A. O(n)

B. O(log n)

C. O(2n)

D. O(log 2n)

14. In _____ tree, the heights of two child subtree of any node differ by at most one

A. Binary tree

B. Red black tree

C. Splay tree

D. AVL tree

15. The height of a BST is given as h. Consider the height of the tree as the no. of edges in the longest path from root to the leaf. The maximum no. of nodes possible in the tree is?

a) 2h-1 -1

b) 2h+1 -1

c) 2h +1

d) 2h-1 +1

16. The no of external nodes in a full binary tree with n internal nodes is?

a) n

b) n+1

c) 2n

d) 2n + 1

17. The difference between the external path length and the internal path length of a binary tree with n internal nodes is?

a) 1

b) n

c) n + 1

d) 2n

18. Suppose a binary tree is constructed with n nodes, such that each node has exactly either zero or two children. The maximum height of the tree will be?

a) (n+1)/2

b) (n-1)/2

c) n/2 -1

d) (n+1)/2 -1

19. Which of the following statement about binary tree is CORRECT?

a) Every binary tree is either complete or full

b) Every complete binary tree is also a full binary tree

c) Every full binary tree is also a complete binary tree

d) A binary tree cannot be both complete and full

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20. Suppose we have numbers between 1 and 1000 in a binary search tree and want to search for the number 363. Which of the following sequence could not be the sequence of the node examined?

a) 2, 252, 401, 398, 330, 344, 397, 363

b) 924, 220, 911, 244, 898, 258, 362, 363

c) 925, 202, 911, 240, 912, 245, 258, 363

d) 2, 399, 387, 219, 266, 382, 381, 278, 363

21. In full binary search tree every internal node has exactly two children. If there are 100 leaf nodes in the tree, how many internal nodes are there in the tree?

a) 25

b) 49

c) 99

d) 101

22. Which type of traversal of binary search tree outputs the value in sorted order?

a) Pre-order

b) In-order

c) Post-order

d) None

23. Suppose a complete binary tree has height h>0. The minimum no of leaf nodes possible in term of h is?

a) 2h -1

b) 2h -1 + 1

c) 2h -1

d) 2h +1

24. **A 2-3 is a tree such that**

a) All internal nodes have either 2 or 3 children

b) All path from root to leaves have the same length

The number of internal nodes of a 2-3 tree having 9 leaves could be

a) 4
b) 5
c) 6
d) 7

25. If a node having two children is to be deleted from binary search tree, it is replaced by its

a) In-order predecessor

b) In-order successor

c) Pre-order predecessor

d) None

26. A binary search tree is formed from the sequence 6, 9, 1, 2, 7, 14, 12, 3, 8, 18. The minimum number of nodes required to be added in to this tree to form an extended binary tree is?

a) 3

b) 6

c) 8

d) 11

27. In a full binary tree, every internal node has exactly two children. A full binary tree with 2n+1 nodes contains

a) n leaf node

b) n internal nodes

c) n-1 leaf nodes

d) n-1 internal nodes

28. he run time for traversing all the nodes of a binary search tree with n nodes and printing them in an order is

a) O(nlg(n))

b) O(n)

c) O(√n)

d) O(log(n))

29. When a binary tree is converted in to an extended binary tree, all the nodes of a binary tree in the external node becomes

a) Internal nodes

b) External nodes

c) Root nodes

d) None

30. If n numbers are to be sorted in ascending order in O(nlogn) time, which of the following tree can be used

a) Binary tree

b) Binary search tree

c) Max-heap

d) Min-heap

31. If n elements are sorted in a binary search tree. What would be the asymptotic complexity to search a key in the tree?

a) O(1)

b) O(logn)

c) O(n)

d) O(nlogn)

32. If n elements are sorted in a balanced binary search tree. What would be the asymptotic complexity to search a key in the tree?

a) O(1)

b) O(logn)

c) O(n)

d) O(nlogn)

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33. The minimum number of elements in a heap of height h is

a) 2h+1

b) 2h

c) 2h -1

d) 2h-1

34. In which of the following tree, parent node has a key value greater than or equal to the key value of both of its children?

a) Binary search tree

b) Threaded binary tree

c) Complete binary tree

d) Max-heap

35. A binary tree T has n leaf nodes. The number of nodes of degree 2 in T is

a) log2n

b) n-1

c) n

d) 2n

36. A binary search tree is generated by inserting in order the following integers:

50, 15, 62, 5, 20, 58, 91, 3, 8, 37, 60, 24

The number of the node in the left sub-tree and right sub-tree of the root, respectively, is

a) (4, 7)

b) (7, 4)

c) (8, 3)

d) (3, 8)

37. Which of the following data structure is non linear type?

A) Strings

B) Lists

C) Stacks

D) Graph

38. Which of the following data structure is linear type?

A) Graph

B) Trees

C) Binary tree

D) Stack

39. The post order traversal of binary tree is DEBFCA. Find out the pre order traversal.

A. ABFCDE

B. ADBFEC

C. ABDECF

D. ABDCEF

40. While converting binary tree into extended binary tree, all the original nodes in binary tree are ....

A. Internal nodes on extended tree

B. External nodes on extended tree

C. Vanished on extended tree

D. Intermediate nodes on extended tree

41. 3) The in-order traversal of tree will yield a sorted listing of elements of tree in ....

A. binary trees

B. binary search trees

C. heaps

D. binary heaps

42. In a binary tree, certain null entries are replaced by special pointers which point to nodes higher in the tree for efficiency. These special pointers are called ....

A. Leaf

B. Branch

C. Path

D. Thread

43. In a head tree .....

A. values in a node is greater than every value every value in left sub tree and smaller than right sub tree.

B. values in a node is greater than every value in children of it.

C. conditions.

D. terms.

44.The in order traversal of tree will yield a sorted listing of elements of tree in ....

A. Binary trees

B. Binary search trees

C. Merging

D. AVL Trees

45. In a graph if e=(u,v) means ....

A. u is adjacent to v but v is not adjacent to u.

B. e begins at u and ends at v

C. u is node and v is an edge.

D. both u and v are edges.

46. A binary tree whose every node has either zero or two children is called ....

A. Complete binary tree

B. Binary Search tree

C. Extended binary tree

D. E2 tree

47. If every node u in G is adjacent to every other node v in G,A graph is said to be ....

A. isolated

B. complete

C. finite

D. strongly connected.

48. The post order traversal of a binary tree is DEBFCA. Find out the pre order Traversal.

A. ABFCDE

B. ADBFEC

C. ABDECF

D. ABDCEF

49. In a graph if e=[u,v], then u and v are called

A. endpoints of e

B. adjacent nodes

C. neighbours

D. all of the above

50. In-order traversing a tree resulted E A C K F H D B G; the pre-order traversal would return.

A. FAEKCDBHG

B. FAEKCDHGB

C. EAFKHDCBG

D. FEAKDCHBG

51. A connected graph T without any cycles is called .

A. a tree graph

B. free tree

C. a tree

D. All of above

52. In linked representation of Binary trees LEFT[k] contains the .... of at the node N, where k is the location.

A. Data

B. Location and left child

C. Right child address

D. Null value

53. If every node u in G adjacent to every other node v in G, A graph is said to be

A. isolated

B. complete

C. finite

D. strongly connected

54. Three standards ways of traversing a binary tree T with root R ....

A. Prefix, infix, postfix

B. Pre-process, in-process, post-process

C. Pre-traversal, in-traversal, post-traversal

D. Pre-order, in-order, post-order

55. A graph is said to be .... if every node u in G is adjacent to every other node v in G.

A. Absolute

B. Entire

C. Inclusive

D. Complete

56. In threaded binary tree .... points to higher nodes in tree.

A. Info

B. Root

C. Threads

D. Child

57. A graph is said to be .... if its edges are assigned data.

A. Tagged

B. Marked

C. Lebeled

D. Sticked

58. If node N is a terminal node in a binary tree then its ....

A. Right tree is empty

B. Left tree is empty

C. Both left & right sub trees are empty

D. Root node is empty

59. The operation of processing each element in the list is known as ......

A. sorting

B. merging

C. inserting

D. traversal

60. Other name for directed graph is ....

A. Direct graph

B. Digraph

C. Dir-graph

D. Digraph

61. Binary trees with threads are called as ....

A. Threaded trees

B. Pointer trees

C. Special trees

D. Special pointer trees

62. Graph G is .... if for any pair u, v of nodes in G there is a path from u

to v or path from v to u.

A. Leterally connected

B. Widely Connected

C. Unliterally connected

D. Literally connected

63.In Binary trees nodes with no successor are called ......

A. End nodes

B. Terminal nodes

C. Final nodes

D. Last nodes

64.A connected graph T without any cycles is called ....

A. free graph

B. no cycle graph

C. non cycle graph

D. circular graph

65.Trees are said .... if they are similar and have same contents at corresponding nodes.

A. Duplicate

B. Carbon copy

C. Replica

D. Copies

66.A connected graph T without any cycles is called a ....

A. A tree graph
B. Free tree
C. A tree d
D. All of the above

67.Every node N in a binary tree T except the root has a unique parent called the .... of N.

A. Antecedents

B. Predecessor

C. Forerunner

D. Precursor

68. In a graph if E=(u,v) means ......

A. u is adjacent to v but v is not adjacent to u

B. e begins at u and ends at v

C. u is processor and v is successor

D. both b and c

69. Sequential representation of binary tree uses ....

A. Array with pointers

B. Single linear array

C. Two dimentional arrays

D. Three dimentional arrays

70. In a graph if e=[u,v], Then u and v are called ....

A. End points of e

B. Adjacent nodes

C. Neighbours

D. All of the above

71. TREE[1]=NULL indicates tree is ....

A. Overflow

B. Underflow

C. Empty

D. Full

72. A binary tree whose every node has either zero or two children is called ....

A. complete binary tree

B. binary search tree

C. extended binary tree

D. data structure

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73. Linked representation of binary tree needs .... parallel arrays.

A. 4

B. 2

C. 3

D. 5

74. The depth of complete binary tree is given by ......

A. Dn = n log2n

B. Dn= n log2n+1

C. Dn = log2n

D. Dn = log2n+1

75. In a 2-tree, nodes with 0 children are called ....

A. Exterior node

B. Outside node

C. Outer node

D. External node

76. Which indicates pre-order traversal?

A. Left sub-tree, Right sub-tree and root

B. Right sub-tree, Left sub-tree and root

C. Root, Left sub-tree, Right sub-tree

D. Right sub-tree, root, Left sub-tree

77. In a extended-binary tree nodes with 2 children are called ....

A. Interior node

B. Domestic node

C. Internal node

D. Inner node

78. A terminal node in a binary tree is called ....

A. Root

B. Leaf

C. Child

D. Branch

79. The post-order traversal of the binary tree is DEBFCA. Find out the pre-order traversal.
A. ABFCDE
B. ADBFEC
C. ABDECF
D. ABDCEF

80. While converting the binary tree into an extended binary tree, all the original nodes in the binary tree are …….
A. Internal nodes on extended tree
B. External nodes on extended tree
C. Vanished on extended tree
D. Intermediate nodes on extended tree

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81. The in-order traversal of the tree will yield a sorted listing of elements of tree in ……..
A. binary trees
B. binary search trees
C. heaps
D. binary heaps

82. In a binary tree, certain null entries are replaced by special pointers which point to nodes higher in the tree for efficiency. These special pointers are called ………
A. Leaf
B. Branch
C. Path
D. Thread

83. In a head tree …..
A. values in a node are greater than every value in the left subtree and smaller than the right subtree.
B. values in a node are greater than every value in children of it.
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C. Merging
D. AVL Trees

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B. e begins at u and ends at v
C. u is node and v is an edge.
D. both u and v are edges.

86. A binary tree whose every node has either zero or two children is called ………
A. Complete binary tree
B. Binary Search tree

C. Extended binary tree
D. E2 tree

87. If every node u in G is adjacent to every other node v in G, A graph is said to be ……..
A. isolated
B. complete
C. finite
D. strongly connected.

88. The post order traversal of a binary tree is DEBFCA. Find out the pre-order Traversal.
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C. ABDECF
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89. In a graph, if e=[u,v], then u and v are called
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D. all of the above

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D. Null value

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C. Pre-traversal, in-traversal, post-traversal
D. Pre-order, in-order, post-order

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A. Absolute
B. Entire
C. Inclusive
D. Complete

96. In threaded binary tree ……… points to higher nodes in the tree.
A. Info
B. Root
C. Threads
D. Child

97. A graph is said to be ……. if its edges are assigned data.
A. Tagged
B. Marked
C. Lebeled
D. Sticked

98. If node N is a terminal node in a binary tree then its ………

A. Right tree is empty
B. Left tree is empty
C. Both left & right subtrees are empty
D. The root node is empty

99. A Tree is a connected?

  A. cyclic undirected graph
  B. acyclic undirected graph
  C. acyclic directed graph
  D. cyclic directed graph

100. A tree with N number of vertices contains?

  A. (N-1) Edges
  B. (N^2)-1 Edges
  C. N Edges
  D. (N+1) Edges