1. The following formula is of :

left\_subtree (keys) ≤ node (key) ≤ right\_subtree (keys)

a. Bianry Tree

b. Complete Binary Tree

c. Binary Search Tree

d. All of the above

Answer: (c).Binary Search Tree

2. Binary search tree has best case run-time complexity of Ο(log n). What could the worst case?

a. Ο(n)

b. Ο(n2)

c. Ο(n3)

d. None of the above

Answer: (a).Ο(n)

3. In order traversal of binary search tree will produce −

a. unsorted list

b. reverse of input

c. sorted list

d. none of the above

Answer: (c).sorted list

4. In binary heap, whenever the root is removed then the rightmost element of last level is replaced by the root. Why?

a. It is the easiest possible way.

b. To make sure that it is still complete binary tree.

c. Because left and right subtree might be missing.

d. None of the above.

Answer: (b).To make sure that it is still complete binary tree.

5. If we choose Prim's Algorithm for uniquely weighted spanning tree instead of Kruskal's Algorithm, then

a. we'll get a different spanning tree.

b. we'll get the same spanning tree.

c. spanning will have less edges.

d. spanning will not cover all vertices.

Answer: (b).we'll get the same spanning tree.

6. The number of binary trees with 3 nodes which when traversed in post order gives the sequence A,B,C is ?

a. 3

b. 4

c. 5

d. 6

Answer: (c).5

7. Which method can find if two vertices x & y have path between them?

a. Depth First Search

b. Breadth First Search

c. Both A & B

d. None A or B

Answer: (c).Both A & B

8. Access time of a binary search tree may go worse in terms of time complexity upto

a. Ο(n2)

b. Ο(n log n)

c. Ο(n)

d. Ο(1)

Answer: (c).Ο(n)

9. Visiting root node after visiting left and right sub-trees is called

a. In-order Traversal

b. Pre-order Traversal

c. Post-order Traveral

d. None of the above

Answer: (c).Post-order Traveral

10. In the deletion operation of max heap, the root is replaced by

a. next available value in the left sub-tree.

b. next available value in the right sub-tree.

c. any random value from the heap.

d. last element of the last level

Answer: (d).last element of the last level

11.All possible spanning trees of graph G

a. have same number of edges and vertices.

b. have same number of edges and but not vertices.

c. have same number of vertices but not edges.

d. depends upon algorithm being used.

Answer: (a).have same number of edges and vertices.

12. Binary search tree is an example of complete binary tree with special attributes.

a. BST does not care about complete binary tree properties.

b. BST takes care of complete binary tree properties.

c. It depends upon the input.

d. None of the above.

Answer: (a).BST does not care about complete binary tree properties.

13. Maximum number of nodes in a binary tree with height k, where root is height 0, is

a. 2k − 1

b. 2k+1 − 1

c. 2k-1 + 1

d. 2k − 1

Answer: (b).2k+1 − 1

14. In a min heap

a. minimum values are stored.

b. child nodes have less value than parent nodes.

c. parent nodes have less value than child nodes.

d. maximum value is contained by the root node.

Answer: (c).parent nodes have less value than child nodes.

15. Re-balancing of AVL tree costs

a. Ο(1)

b. Ο(log n)

c. Ο(n)

d. Ο(n2)

Answer: (b).Ο(log n)

16. A binary search tree whose left subtree and right subtree differ in height by at most 1 unit is called ……

a. AVL tree

b. Red-black tree

c. Lemma tree

d. None of the above

Answer: (a).AVL tree

17. Herder node is used as sentinel in …..

a. Graphs

b. Stacks

c. Binary tree

d. Queues

Answer: (c).Binary tree

18. In the …………….. traversal we process all of a vertex’s descendants before we move to an adjacent vertex.

a. Depth First

b. Breadth First

c. Width First

d. Depth Limited

Answer: (a).Depth First

19. The property of binary tree is

a. The first subset is called left subtree

b. The second subtree is called right subtree

c. The root cannot contain NULL

d. The right subtree can be empty

Answer: (d).The right subtree can be empty

20. State true or false.

i) The degree of root node is always zero.

ii) Nodes that are not root and not leaf are called as internal nodes.

a. True, True

b. True, False

c. False, True

d. False, False

Answer: (c).False, True

21. Any node is the path from the root to the node is called

a. Successor node

b. Ancestor node

c. Internal node

d. None of the above

Answer: (b).Ancestor node

22. State true of false.

i) A node is a parent if it has successor nodes.

ii) A node is child node if out degree is one.

a. True, True

b. True, False

c. False, True

d. False, False

Answer: (b).True, False

23. …………………. Is a directed tree in which out degree of each node is less than or equal to two.

a. Unary tree

b. Binary tree

c. Trinary tree

d. Both B and C

Answer: (b).Binary tree

24. State true or false.

i) An empty tree is also a binary tree.

ii) In strictly binary tree, the out-degree of every node is either o or 2.

a. True, False

b. False, True

c. True, True

d. False, False

Answer: (c).True, True

25. When inorder traversing a tree resulted E A C K F H D B G; the preorder traversal would return

a. FAEKCDBHG

b. FAEKCDHGB

c. EAFKHDCBG

d. FEAKDCHBG

Answer: (b).FAEKCDHGB

26. 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. None of above

Answer: (c).Extended binary tree

27. The depth of a complete binary tree is given by

a. Dn = n logn+1

b. Dn = logn

c. Dn = logn+1

d. Dn = n logn

Answer: (c).Dn = logn+1

28. When representing any algebraic expression E which uses only binary operations in a 2-tree,

a. the variable in E will appear as external nodes and operations in internal nodes

b. the operations in E will appear as external nodes and variables in internal nodes

c. the variables and operations in E will appear only in internal nodes

d. the variables and operations in E will appear only in external nodes

Answer: (a).the variable in E will appear as external nodes and operations in internal nodes

29. A binary tree can easily be converted into a 2-tree

a. by replacing each empty sub tree by a new internal node

b. by inserting an internal nodes for non-empty node

c. by inserting an external nodes for non-empty node

d. by replacing each empty sub tree by a new external node

Answer: (d).by replacing each empty sub tree by a new external node

30.When 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. None of above

Answer: (a).internal nodes on extended tree

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

a. ABFCDE

b. ADBFEC

c. ABDECF

d. ABDCEF

Answer: (c).ABDECF

32.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

Answer: (d).thread

33. 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. None of above

Answer: (b).Binary search trees

34. In a Heap tree

a. Values in a node is greater than 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. Both of above conditions applies

d. None of above conditions applies

Answer: (b).Values in a node is greater than every value in children of it

35. Let T be a binary search tree with 15 nodes. The minimum and maximum possible heights of T are:

Note: The height of a tree with a single node is 0.

a. 4 and 15 respectively

b. 3 and 14 respectively

c. 4 and 14 respectively

d. 3 and 15 respectively

Answer: (b).3 and 14 respectively

36.Let T be a tree with 10 vertices. The sum of the degrees of all the vertices in T is \_\_\_\_\_.

a. 18

b. 19

c. 20

d. 21

Answer: (a).18

37. B Trees are generally

a. very deep and narrow

b. very wide and shallow

c. very deep and very wide

d. cannot say

Answer: (d).cannot say

38.If a node having two children is deleted from a binary tree, it is replaced by its

a. Inorder predecessor

b. Inorder successor

c. Preorder predecessor

d. None of the above

Answer: (b).Inorder successor

39. A full binary tree with 2n+1 nodes contain

a. n leaf nodes

b. n non-leaf nodes

c. n-1 leaf nodes

d. n-1 non-leaf nodes

Answer: (b).n non-leaf nodes

40.If a node in a BST has two children, then its inorder predecessor has

a. no left child

b. no right child

c. two children

d. no child

Answer: (b).no right child

41. A binary tree in which if all its levels except possibly the last, have the maximum number of nodes and all the nodes at the last level appear as far left as possible, is known as

a. full binary tree

b. AVL tree

c. threaded tree

d. complete binary tree

Answer: (a).full binary tree

42. A full binary tree with n leaves contains

a. n nodes

b. log n 2 nodes

c. 2n –1 nodes

d. 2 nodes

Answer: (c).2n –1 nodes

43.The number of different directed trees with 3 nodes are

a. 2

b. 3

c. 4

d. 5

Answer: (b).3

44. One can convert a binary tree into its mirror image by traversing it in

a. inorder

b. preorder

c. postorder

d. any order

Answer: (c).postorder

45.A B-tree of minimum degree t can maximum \_\_\_\_\_ pointers in a node.

a. t–1

b. 2t–1

c. 2t

d. t

Answer: (d).t

46. A BST is traversed in the following order recursively: Right, root, left. The output sequence will be in

a. Ascending order

b. Descending order

c. Bitomic sequence

d. No specific order

Answer: (b).Descending order

47. The pre-order and post order traversal of a Binary Tree generates the same output. The tree can have maximum

a. Three nodes

b. Two nodes

c. One node

d. Any number of nodes

Answer: (c).One node

48. A binary tree of depth “d” is an almost complete binary tree if

a. Each leaf in the tree is either at level “d” or at level “d–1”

b. For any node “n” in the tree with a right descendent at level “d” all the left descendents of “n” that are leaves, are also at level “d”

c. Both a and b

d. None of the above

Answer: (c).Both a and b

49.What is the maximum possible number of nodes in a binary tree at level 6?

a. 36

b. 6

c. 1

d. 64

Answer: (d).64

50. How many nodes in a tree have no ancestors.

a. 0

b. 1

c. 2

d. n

Answer: (b).1

51. In order to get the contents of a Binary search tree in ascending order, one has to traverse it in

a. pre-order

b. in-order

c. post order

d. not possible

Answer: (b).in-order

52. In order to get the information stored in a Binary Search Tree in the descending order, one should traverse it in which of the following order?

a. left, root, right

b. root, left, right

c. right, root, left

d. right, left, root

Answer: (c).right, root, left

53. A \_\_\_\_\_\_\_\_\_\_is a non-linear data structure representing the hierarchical structure of one or more elements known as nodes.

a. Tree

b. Child nodes

c. Leaf nodes

d. None of the above

Answer: (a).Tree

54.Each node of a tree stores a data value and has zero or more pointers pointing to the other nodes of the tree, which are also known as its\_\_\_\_\_\_\_\_\_\_.

a. Child nodes

b. Leaf nodes

c. Root

d. None of the above

Answer: (a).Child nodes

55. The node at the top of a tree is known as the \_\_\_\_\_\_\_\_of the tree.

a. Heap

b. Leaf nodes

c. Child nodes

d. Root

Answer: (d).Root

56. Internal nodes have\_\_\_\_\_\_\_\_\_\_\_.

a. Child nodes

b. Parent nodes

c. Both (a) and (b)

d. None of the above

Answer: (c).Both (a) and (b)

57. Which concept is useful while writing programming code for implementing various operations on trees?

a. Recursion

b. Huffman’s algorithm

c. Internal nodes

d. None of the above

Answer: (a).Recursion

58. A binary tree is a special type of tree, which can either be empty or have a finite set of nodes, such that, one of the nodes is designated as the root node and the remaining nodes are partitioned into sub trees of the root nodes known as\_\_\_\_\_\_\_\_\_\_.

a. Left sub tree

b. Right sub tree

c. Both (a) and (b)

d. Heap tree

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Answer: (c).Both (a) and (b)

59.Unlike a general tree, each node in a binary tree is restricted to have at the most \_\_\_\_\_\_\_\_\_\_child nodes only.

a. Four

b. Three

c. Two

d. One

Answer: (c).Two

60.A binary tree is a \_\_\_\_\_\_\_\_data structure; each node belongs to a particular level number.

a. Dual level

b. Multilevel

c. Tri level

d. Single level

Answer: (b).Multilevel

61.The nodes belonging to the same parent node are known as\_\_\_\_\_\_\_.

a. Sibling nodes

b. Parent nodes

c. Child nodes

d. None of the above

Answer: (a).Sibling nodes

62. The depth of a binary tree is the highest level number of any \_\_\_\_\_\_ in the binary tree.

a. Leaf node

b. Parent node

c. Sibling node

d. None of the above

Answer: (a).Leaf node

63. Which line connects any two nodes?

a. Edge

b. Depth

c. Level

d. None of the above

Answer: (a).Edge

64. The degree of a node is equal to the number of its\_\_\_\_\_\_\_\_\_\_.

a. Child nodes

b. Parent nodes

c. Sibling nodes

d. Tree nodes

Answer: (a).Child nodes

65. The nodes belonging to the same parent node are known as\_\_\_\_\_\_\_\_\_.

a. Parent nodes

b. Sibling nodes

c. Tree nodes

d. None of the above

Answer: (b).Sibling nodes

66. A binary tree is said to be a complete binary tree if all the leaf nodes of the tree are at \_\_\_\_\_\_\_\_.

a. Same level

b. Opposite level

c. Different level

d. Adjacent level

Answer: (a).Same level

67. A binary tree is said to be an extended binary tree (also known as 2-tree) if all of its nodes are of \_\_\_\_\_\_\_.

a. Zero degree

b. Two degrees

c. Both (a) and b)

d. None of the above

Answer: (c).Both (a) and b)

68. Like \_\_\_\_\_\_\_\_\_- binary trees can also be represented in two ways in the memory—array (sequential) representation and linked representation.

a. Stacks

b. Queues

c. Strings

d. Both (a) and (b)

Answer: (d).Both (a) and (b)

69. In the array representation, what is represented sequentially in memory using a single one-dimensional array?

a. Binary tree

b. Stacks

c. Nodes

d. None of the above

Answer: (a).Binary tree

70. The linked representation of a binary tree is implemented by using a linked list having an\_\_\_\_\_\_\_\_\_.

a. Info part

b. Two pointers- left and right

c. Both (a) and (b)

d. One pointer

Answer: (c).Both (a) and (b)

71.Traversing a binary tree refers to the process of visiting each and every node of the tree exactly how many times?

a. Once

b. Twice

c. Thrice

d. None

Answer: (a).Once

72. In how many different ways can a tree be traversed?

a. Two ways

b. Three ways

c. One way

d. It cannot be traversed

Answer: (b).Three ways

73. In pre-order traversal, the root node is visited before traversing its\_\_\_\_\_\_\_\_subtrees.

a. Left

b. Right

c. Both (a) and (b)

d. None of the above

Answer: (c).Both (a) and (b)

74. In which traversal, the root node is visited after the traversal of its left subtree and before the traversal of its right subtree?

a. Pre-order traversal

b. In-order traversal

c. Post-order traversal

d. Level-order traversal

Answer: (b).In-order traversal

75. Elements in a nonlinear data structure do not form a sequence for example\_\_\_\_\_\_\_\_\_.

a. Tree

b. Hash tree

c. Binary tree

d. All of the above

Answer: (d).All of the above

76. One way is to have the linear relationship between the elements by means of sequential memory locations and such linear structures are called \_\_\_\_\_\_.

a. Linked list

b. Stacks

c. Arrays

d. All are the same

Answer: (c).Arrays

77. What is one of the most common operations that is performed on trees?

a. Traversal of nodes

b. Threads

c. Pointers

d. None of the above

Answer: (a).Traversal of nodes

78. In which tree, the right NULL pointer of each node (not having a right child node) points to its in-order successor?

a. Right-threaded binary tree

b. Left-threaded binary tree

c. Full-threaded binary tree

d. All of the above

Answer: (a).Right-threaded binary tree

79. A binary search tree, also known as\_\_\_\_\_\_\_\_\_.

a. Binary tree

b. Binary sorted tree

c. Sibling node

d. Heap trees

Answer: (b).Binary sorted tree

80. Which code for an alphabet (set of symbols) is generated by constructing a binary tree with nodes containing the symbols to be encoded and their probabilities of occurrence?

a. Algorithm

b. Hughman code

c. Huffman code

d. Canonical Huffman codes

Answer: (c).Huffman code

81. Trees are often used in implementing \_\_\_\_\_\_\_\_\_ and hence it is considered as prime application of trees.

a. Chess

b. Players

c. Games

d. None of the above

Answer: (c).Games

82. The process of inserting a node in a binary search tree can be divided into how many steps?

a. Three

b. Two

c. Four

d. None of the above

Answer: (b).Two