Started on	Tuesday, 2 December 2025, 12:27 PM
State	Finished
Completed on	Tuesday, 2 December 2025, 12:42 PM
Time taken	15 mins 1 sec
Marks	8.00/20.00
Grade	**40.00** out of 100.00

Question 1

Complete

Mark 1.00 out of 1.00

A queue implemented with a circular array has front == rear. This means:

- a. Queue full
- b. Queue empty
- c. Array corrupted
- d. Both possible depending on overflow flag

Question 2

Complete

Mark 1.00 out of 1.00

A stack implemented using two queues can achieve O(1) pop if:

- a. We make push costly
- b. We alternate queues
- c. We use circular queues
- d. We enqueue twice each time

Question 3

Complete

Mark 0.00 out of 1.00

Complexity of deleting an arbitrary node from a Fibonacci heap is:

- a. O(1)
- b. O(√n)
- c. O(n)
- d. O(log n)

Question 4

Complete

Mark 1.00 out of 1.00

Floyd-Warshall can detect negative cycles when:

a. dist[i][i] == 0
b. dist[i][i] > 0
c. Graph gets disconnected
d. dist[i][i] < 0

Question 5

Complete

Mark 0.00 out of 1.00

For a perfect binary tree with 127 nodes, how many leaf nodes are there?

a. 32
b. 31
c. 63
d. 64

Question 6

Complete

Mark 0.00 out of 1.00

In a binary tree, if every internal node has exactly one child, the height is:

a. O(log n)
b. O(n log n)
c. Constant
d. O(n)

Question 7

Complete

Mark 0.00 out of 1.00

In a graph with V vertices, how many DFS trees are generated in the worst case?

a. 1
b. Depends on edges
c. log V
d. V

Question 8

Complete

Mark 1.00 out of 1.00

In a linked list with random pointers, copying the list with O(1) extra space is done by:

- a. Morris traversal
- b. Interleaving cloned nodes
- c. Hashmap reduction
- d. Two-pointer merge

Question 9

Complete

Mark 0.00 out of 1.00

In a skip list with n elements, expected height is:

- a. 1
- b. n
- c. √n
- d. log n

Question 10

Complete

Mark 1.00 out of 1.00

In a Trie for lowercase English letters, the maximum degree of a node is:

- a. 26
- b. 1
- c. Unlimited
- d. 52

Question 11

Complete

Mark 1.00 out of 1.00

In an array rotated k times, what is the time complexity of finding k using binary search?

- a. O(log n)
- b. O(n)
- c. O(1)
- d. O(k)

Question 12

Complete

Mark 0.00 out of 1.00

In KMP, the LPS array helps to:

- a. Compute prefix hashes
- b. Avoid recomputing comparisons
- c. Expand matching window
- d. Count patterns

Question 13

Complete

Mark 0.00 out of 1.00

Merging two max heaps of size n each requires:

- a. O(n log n)
- b. O(log n)
- c. O(n)
- d. O(1)

Question 14

Complete

Mark 0.00 out of 1.00

The number of distinct BSTs that can be constructed using keys {1,2,3,4} is:

- a. 42
- b. 14
- c. 24
- d. 20

Question 15

Complete

Mark 0.00 out of 1.00

What is the minimum number of comparisons needed to find both the minimum and maximum of an array of 100 elements?

- a. 198
- b. 150
- c. 147
- d. 199

Question 16

Complete

Mark 1.00 out of 1.00

Which can be used to check if a directed graph is strongly connected?

- a. Kosaraju's or Tarjan's algorithm
- b. BFS twice
- c. DFS from every node
- d. Floyd–Warshall

Question 17

Complete

Mark 0.00 out of 1.00

Which data structure guarantees removal of highest-frequency element in O(log n)?

- a. Balanced BST
- b. Simple heap
- c. Frequency heap
- d. HashMap

Question 18

Complete

Mark 0.00 out of 1.00

Which of the following makes QuickSort worst-case even with random pivots?

- a. Already sorted array
- b. Duplicate elements
- c. All elements equal
- d. Reverse-sorted array

Question 19

Complete

Mark 1.00 out of 1.00

Which of the following operations is amortized O(1) in a dynamic array?

- a. Deletion at front
- b. Random access
- c. Insertion at end
- d. Searching for an element

Question 20

Complete

Mark 0.00 out of 1.00

Which traversal order prints nodes in ascending order for a max heap?

- a. Inorder
- b. Level order
- c. Preorder
- d. None of the above