Branch: CSE/IT

Batch: Hinglish

Data Structure

Tree

DPP-06

[NAT]

1. The maximum number of comparisons to find the maximum element in a min heap of 1024 elements is

[MCQ]

2. Consider the array given below:

50	40	10	5	60	70	40	15	80
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The minimum number of comparisons required to convert the above array into max heap is _____

[NAT]

3. Consider the array given below:

50	40	10	5	60	70	40	15	80
50	40	10	J	UU	70	40	13	00

The minimum number of swap operations required to convert the above array into max-heap is ______.

[MCQ]

4. Consider the array given below:

50	40	10	5	60	70	40	15	80

The resultant max-heap using bottom-up approach of build heap is-

- (a) 80, 60, 70, 40, 50, 10, 40, 15, 5
- (b) 80, 70, 60, 50, 40, 10, 40, 5, 15
- (c) 80, 70, 60, 50, 40, 40, 15, 10, 5
- (d) None of the above

[NAT]

5. Consider a sequence of elements are inserted into a max-heap one after another as-50, 40, 10, 5, 60, 70, 40, 15, 80

The number of shift operations required in building the heap one element at a time is ______.

[MCQ]

6. Consider a sequence of elements are inserted into a max-heap one after another as-

The resultant max-heap using bottom-up approach of build heap is-

- (a) 80, 60, 70, 40, 50, 10, 40, 15, 5
- (b) 80, 70, 60, 50, 40, 10, 40, 5, 15
- (c) 80, 70, 60, 50, 40, 40, 15, 10, 5
- (d) None of the above

[MCQ]

- **7.** Consider the following two statements:
 - **P:** The number of comparisons required to find the minimum element in a min heap of n elements is n-1.
 - **Q:** Only one comparison is required to find the minimum element in a max heap of n elements.

Which of the following is/are CORRECT?

- (a) Ponly
- (b) Q only
- (c) Both P and Q
- (d) Neither P nor Q

Answer Key

1. (511)

2. (10)

3. (5)

4. (a)

5. (8)

6. (b)

7. (d)



Hints and Solutions

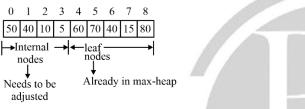
(511)1.

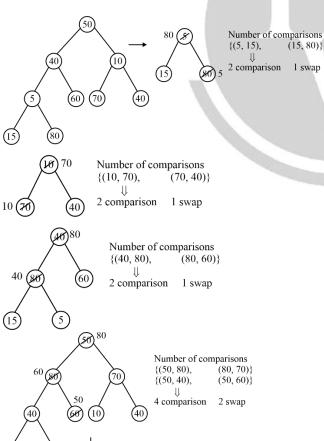
The maximum element will be present in the leaf nodes.

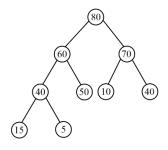
Number of leaf nodes in the min-heap of 1024 elements = 1024/2 = 512

Maximum number of comparisons to find the maximum element in a min heap of 1024 elements = 512 - 1 = 511.

(10)



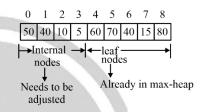


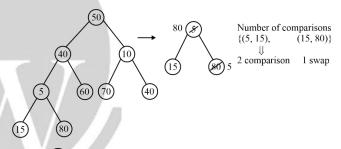


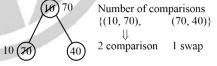
(5) 3.

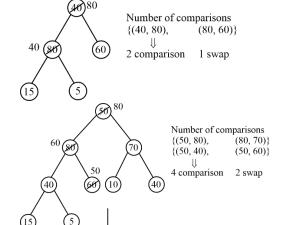
(15, 80)

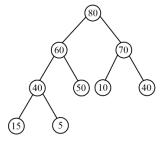
1 swap



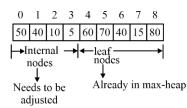


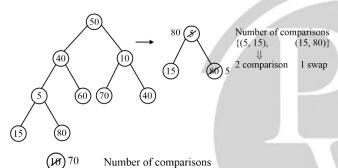


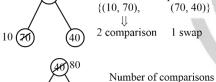


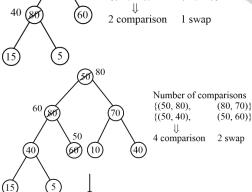


4. (a)



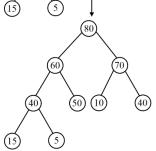




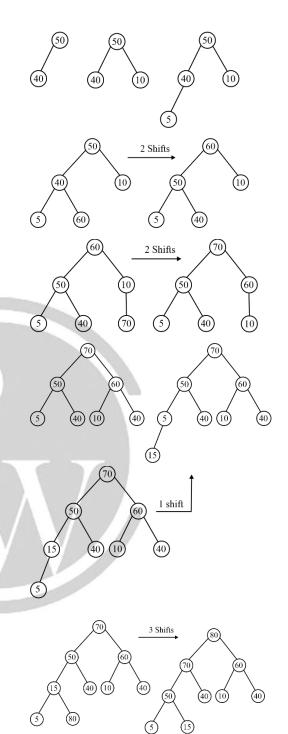


{(40, 80),

(80, 60)



5. (8)



6. (b)

The resultant max-heap is-80, 70, 60, 50, 40, 10, 40, 5, 15

7. (d)

- **P:** INCORRECT. The number of comparisons required to find the minimum element in a min heap of n elements is 1.
- **Q:** INCORRECT. Only one comparison is not sufficient to find the minimum element in a max heap of n elements.





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