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

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

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-
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

[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) P only
(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

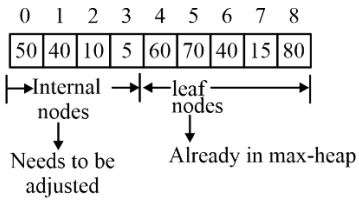
1. (511)

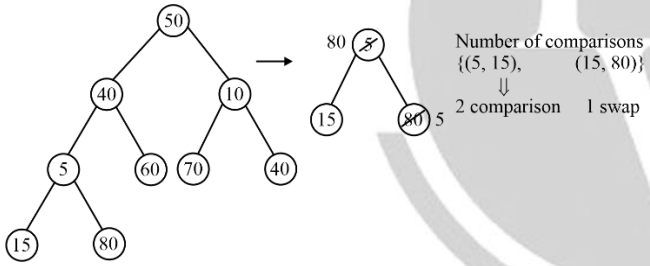
The maximum element will be present in the leaf nodes.

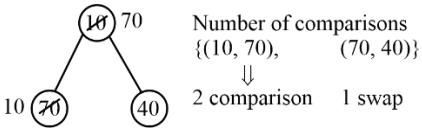
Number of leaf nodes in the min-heap of 1024 elements = 1024/2 = 512

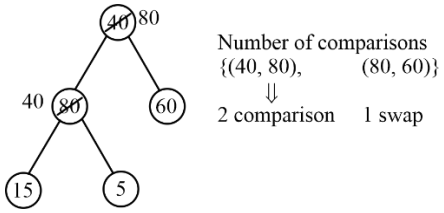
Maximum number of comparisons to find the maximum element in a min heap of 1024 elements = 512 – 1 = 511.

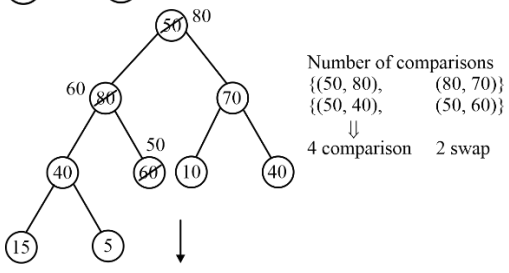
2. (10)

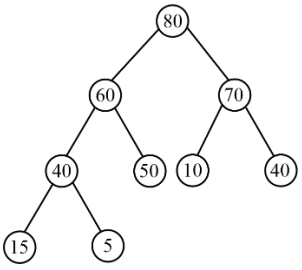




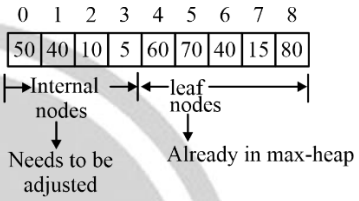


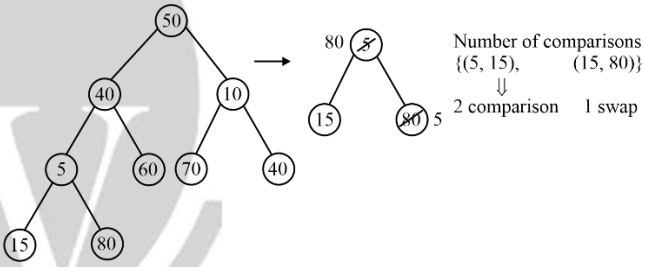


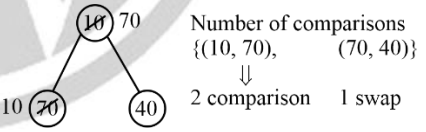


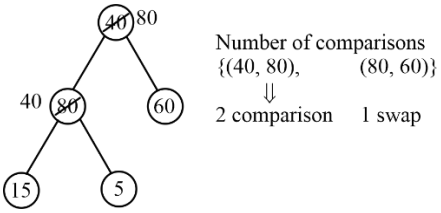


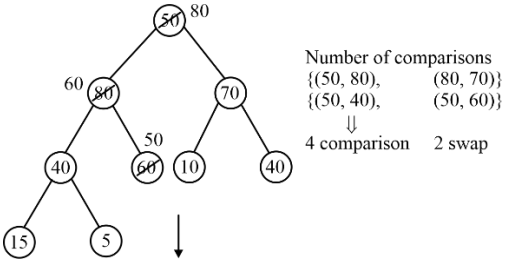
3. (5)

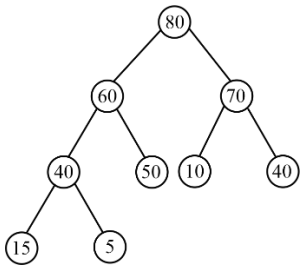




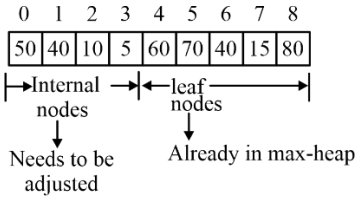


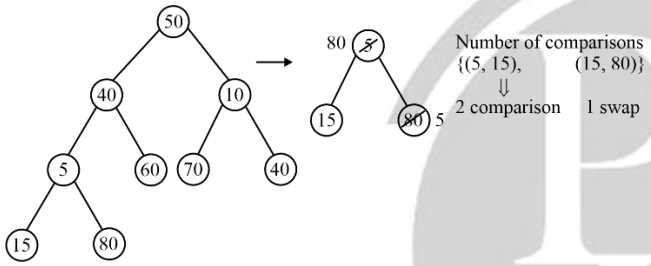


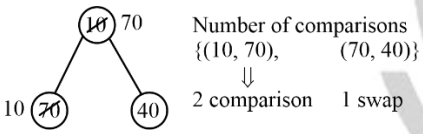


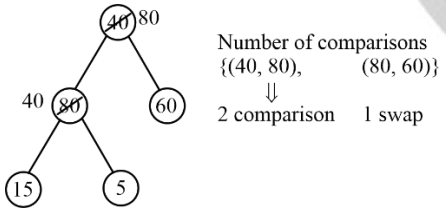


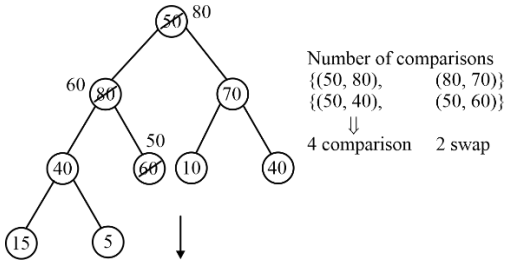
4. (a)

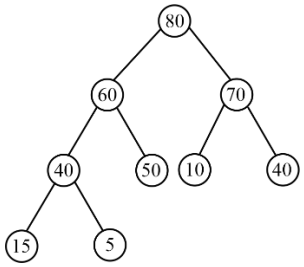




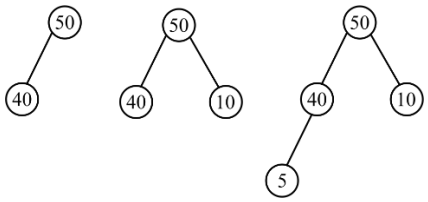


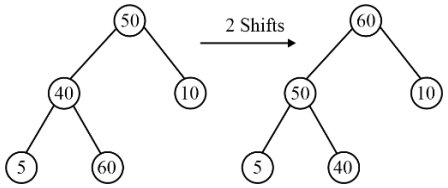


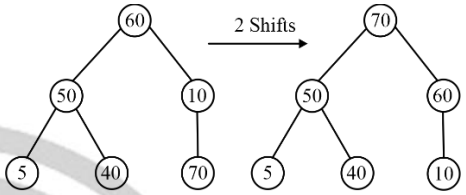


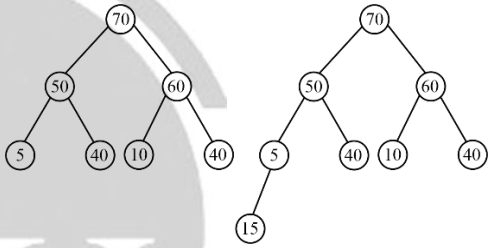


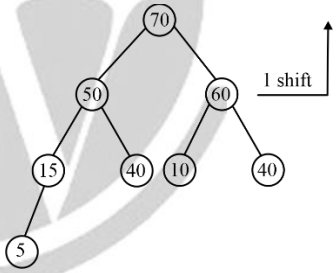
5. (8)

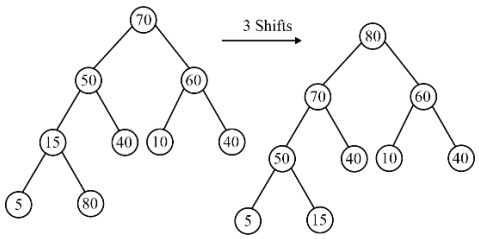












6. (b)

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.