Q.1 The maximum number of comparisons to find the maximum element in a min heap of 1024 elements is ___511___   [NAT]

leaf nodes

n elements $\left\lceil \dfrac{n}{2} \right\rceil$

$\left\lceil \dfrac{3}{2} \right\rceil = \lceil 1.5 \rceil = 2$

$\left\lceil \dfrac{4}{2} \right\rceil = 2$

$n = 6$ $\left\lceil \dfrac{6}{2} \right\rceil = 3$

$\left\lceil \dfrac{7}{2} \right\rceil = \lceil 3.5 \rceil = 4$

$$1024$$

$$\# \text{leaf} = \left\lceil \frac{1024}{2} \right\rceil$$

$$= 512$$

element

Q

$$512 - 1$$

$$= \boxed{511}$$

$$\left.\begin{array}{c} c_1, c_2 > y \\ c_3\, c_4 > z \end{array}\right]$$

$y, z \Rightarrow$ Can not be largest

Q.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 __10__

Q.3

Consider the array given below:

[NAT]

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 _____.

Consider the array given below:

[NAT]

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 ___5___.

Q.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-
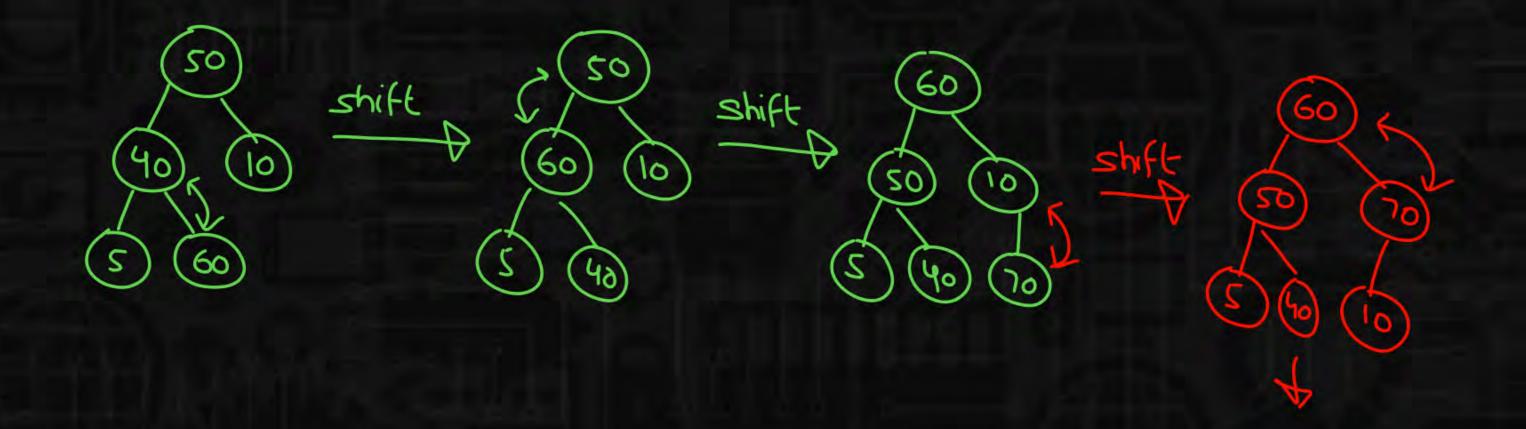
A. 80, 60, 70, 40, 50, 10, 40, 15, 5

B. 80, 70, 60, 50, 40, 10, 40, 5, 15

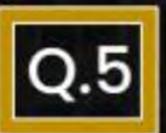C. 80, 70, 60, 50, 40, 40, 15, 10, 5
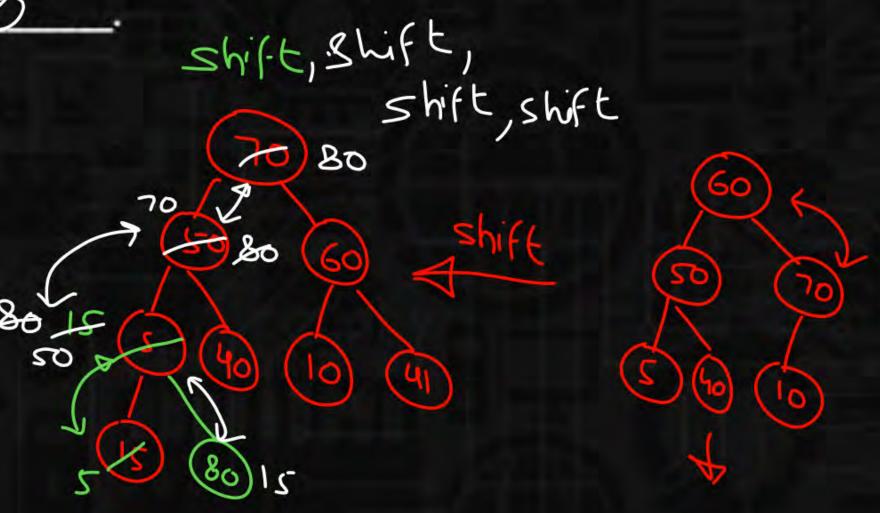
D. None of the above

Q.5

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

50, 40, 10, 5, 60, 70, 4|, 15, 80

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

Consider a sequence of elements are inserted into a   [NAT]   (P W)
max-heap one after another as-

50, 40, 10, 5, 60, 70, 4█, 15, 80

The number of shift operations required in building the heap one
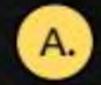element at a time is ___8___ .

Q.6

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

[MCQ]

$$50, 40, 10, 5, 60, 70, 40, 15, 80$$

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

Q.7 Consider the following two statements: [MCQ]

Incorrect

P: The number of comparisons required to find the minimum
element in a min heap of n elements is n − 1.   *return A[1]*

Incorrect

Q: Only one comparison is required to find the minimum
element in a max heap of n elements.

$\left\lceil \frac{n}{2} \right\rceil - 1$

Which of the following is/are CORRECT?

A. P only

B. Q only

C. Both P and Q

D. Neither P nor Q