Started on	Wednesday, 3 May 2023, 6:11 PM
State	Finished
Completed on	Wednesday, 3 May 2023, 6:22 PM
Time taken	11 mins 1 sec
Marks	4.50/6.00
Grade	**7.50** out of 10.00 (**75**%)

Question 1

Partially correct

Mark 0.50 out of 1.00

Which of the following sorting algorithms has the **least** worst-case running time?

- a. Heapsort
- b. Merge Sort ✔
- c. Insertion Sort
- d. Bubble Sort

The correct answers are: Merge Sort, Heapsort

Question 2

Correct

Mark 1.00 out of 1.00

What is the worst-time complexity of HEAPSORT operation?

- a. O(n)
- b. O(n log(n)) ✔
- c. O(log(n))
- d. $O(n^2)$

The correct answer is: O(n log(n))

Question 3

Correct

Mark 1.00 out of 1.00

Which of the following is the recurrence relation for Heapify Operation?

a. $T(n) \leq T(3n/2) + \Theta(1)$

b. $T(n) \leq T(2n/3) + \Theta(1)$ ✔

c. $T(n) \leq T(2n/3) + \Theta(n)$

d. $T(n) \leq T(n/2) + \Theta(1)$

The correct answer is: $T(n) \leq T(2n/3) + \Theta(1)$

Question 4

Correct

Mark 1.00 out of 1.00

What is the index of the right child of the element with index 4 when a heap is stored in an array?

(Assume the array is 1-indexed)

Select one:

a. 3

b. Not exact

c. 9 ✔

d. 8

Your answer is correct.

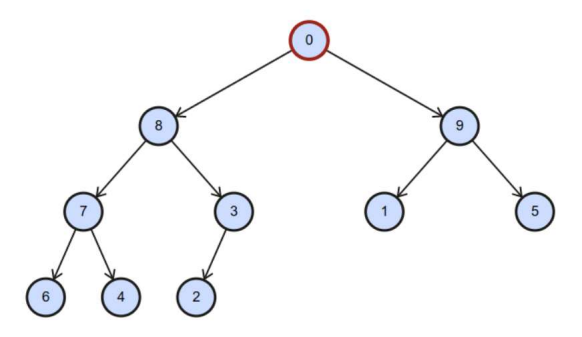
Right child of i th item is stored at 2*i + 1

The correct answer is:
9

Question 5

Incorrect

Mark 0.00 out of 1.00



Assume we MAX-HEAPIFY the above tree from the top node.

What would be the value at the node that has the value 9 after the MAX-HEAPIFY operation?

(Please provide the answer in digits)

Answer: 0 ✖

First top node (0) gets switched with 9. Then 0 again gets switched with 5. So In place of 9 we get 5 at the end.

The correct answer is: 5

Question 6

Correct

Mark 1.00 out of 1.00

What is the worst-time complexity of HeapExtract operation?

- a. O(n)
- b. O(n log(n))
- c. O(log(n)) ✔
- d. $O(n^2)$

The correct answer is: O(log(n))