(17) -> Divide with Recursion

Quiz

(7) -> which of following ex the worst case for an insertion sort

(B) Sorted in reverse order

(17) -> Necessary Condⁿ for binary Search

(C) Array Sorted

(18) -> Complexity of Linear Search -> O(n) (a)

(19) -> Complexity of Binary Search -> (D) -> O(logn)

(20) -> Application of binary Search

-> find lower/upper bound, union of intervals

-> Debugging

NOT -> To search in unordered list

(21) -> Binary Search -> (B) Divide & Conquer

(22) -> arr = {5, 6, 77, 88, 99}, key = 88 find iterations

(2) 2 (Binary Search)

(23) -> Mid values for first 2 iterations

key = 100, arr |45|77|89|90|94|99|100|

(A) -> 90 & 99

Date... 3/10/23

(24) → Complexity of Insertion sort where position of data to be inserted is calculated using Binary Search?

(A) ⇒ $O(N^2)$

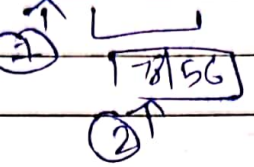
$O(N) \rightarrow O(\log n) \rightarrow BS$

Ref (1) → Calculate the position

(2) → create gap where data will be inserted

(25) → arr = |12|13|35|78|56|, key = 78 ; iterations?

(B) ⇒ 2

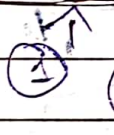


(26) → Binary Search algorithm :-

(D) Put element in order, compare with the middle value, split the list in order & repeat.

(27) → Time complexity of BS → (D) $O(1)$

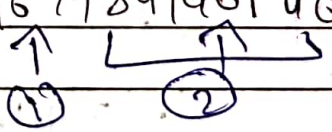
(28) → |3|5|7|10|23| ; iteration to find 7



(A) ⇒ 0 - 1

(29) → Mid value, |23|45|67|89|90|46|, key = 90?

(C) → 67 & 90



(30) → Recurrence for worst case of Binary Search?

(C) $T(n) = T\left(\frac{n}{2}\right) + O(1)$ & $T(1) = T(0) = O(1)$

Teacher's Sign.....

(15) → sorted / Identical Element

Date 7/10/23

	Best	Avg	Worst
Bubble sort	O(n)	O(n²)	O(n)
Selection sort	O(n²)	O(n²)	O(n²)
Insertion sort	O(n)	O(n²)	O(n²)

⇒ Sorted Array — Iteration

Bubble sort — 1

Selection sort — 4

Insertion sort — 1

(4) → arr = [3|4|5|2|1]

bubble sort(i) [3|4|5|2|1]

after 1st (ii) 3 4 |2|1|5

2nd (iii) 3|2|1|4|5

3rd (iv) 2|1|3|4|5

4th (v) 1|2|3|4|5

Insertion sort

(3)|4|5|2|1

after 1st 3|4|5|2|1

2nd 3|4|5|2|1

3rd 2|3|4|5|2|1

4th 1|2|3|4|5

(7) → After second pass Insertion sort

arr = [5|8|64|51|32|21]

(P) → 1st Pass 3 4 |8| 64 | 51 | 32 | 21

2nd → 8|34|64|51|32|21

APCO

Scanned with CamScanner

Date... 3/10/22

(8) -> Insertion sort pass 14 12 16 6 3 10

1st 12 14 16 6 3 10
2nd 12 14 16 6 3 10
3rd 6 12 14 16 3 10
4th 3 6 12 14 16 10
5th 3 6 10 12 14 16

(11) -> Passes -> Insertion sort algo
(B) n-1

(12) -> Insertion sort take space O(1) -> what does it mean?
(B) -> It means amount of extra memory Insertion sort consumes doesn't depend on the input. The algo should use the same amount of memory for all inputs.

(13) -> ar = 6 4 8 1 3 -> Insertion sort (Place element 1)

4 6 8 1 3 -> 1 4 6 8 3
25 + 25
50

(14) -> Insertion sort step
5 4 3 2 1 -> 4 5 3 2 1 -> 3 4 5 2 1 -> 2 3 4 5 1
1 2 3 4 5

(15) -> Identical to life
Best from (a) Insertion sort
(b) Heap sort
(c) Merge sort
(d) Selection sort

(16) Sorted or almost sorted

APCO

Teacher's Sign.....