



Roll no.....

End Semester Examination, December 2024

B.Tech/BCA – 3rd Semester

COMPETITIVE CODING-I (AUC001)

Time: 2.5 hrs.

Max Marks: **50**

Note: **All Questions are compulsory.** Marks are indicated against each question.

PART-A

Q.1 First question will consist of 7 small questions covering the entire syllabus out of which the student has to attempt 5 questions and the understanding level will be assessed.

(a) The worst-case time complexity of Merge Sort is $O(_)$.

1. $O(\log n)$ 2. $O(n)$ 3. $O(n \log n)$. 4. $O(n^*n)$

(b) **Array and String - Find the Output:**

Given the string `str = "data science"`, what character will be on the 7th index?

1. a 2. s 3. e 4. i

(c) The time complexity of Bubble Sort in the average case is $O(_)$.

1. $O(\log n)$ 2. $O(n)$ 3. $O(n \log n)$ 4. $O(n^*n)$

[CO-1] [L-] 2

(d) In a sorted array, to find the maximum element, the time complexity in the worst case is $O(_)$.

[CO-1] [L-] 2

1. $O(\log n)$ 2. $O(n)$ 3. $O(n \log n)$. 4. $O(1)$

(e) Consider the following array:

`arr = [1, 4, 2, 5, 3]`

what will be the output of `arr[5]`.

1. 3 2. error 3. `IndexOutOfRangeException` 4. compile error

[CO-1] [L-] 2

(f) `int[] arr = {10, 22, 35, 40, 20};` [CO-1] [L-] 2
`int result = 0;`
`for (int i = 0; i < arr.length; i++)`
`{ if (i % 10 == 0) {`
`result += arr[i];`
`} else {`
`result -= arr[i];`
`}`
`}`
`print(result);`

1. 13 2. 23 3. 14 4. 18

(g) `input X = 3` [CO-1] [L-] 2
`input Y = 2`
`Z = 0`
`for i = 1 to X do`
`for j = 1 to Y do`
`Z = Z + i * j`
`output Z`

1. 18 2. 17 3. 22 4. 20

2x5

PART-B

Q.2 Write a program to sort the array using of any sorting algorithm [CO-2] [L-] 10
Input: `arr = [15,3,1,6,5,8]`
Output: `[1,3,5,6,8,15]`

OR

Write a program to reverse the given array. [CO-2] [L-] 10
Input: `arr = [15,31,1,6,4,30]`
Output: `[30,4,6,1,31,15]`

Q.3 Write the intuition and code of the bubble sort algorithm. [CO-3] [L-] 10

OR

Write the intuition and code of the selection sort algorithm. [CO-3] [L-] 10

Q.4 Write the program to find the target element index in a sorted array in O(logn) time complexity. [CO-4] [L-] 10
Input: `arr = [4,7,9,10,15,22,29]` `target = 7`
Output: 1

OR

Write an insertion sort algorithm to sort the array. [CO- 4] [L-] 10

Q.5 Write a program to find the count of vowels and consonants characters in a given string. [CO-5] [L-] 10
String = "krmangalamuniversity"

OR

Write a program to reverse the given String.

String = "KRMU" [CO- 5] [L-] 10