

Minor Test I – June 2021  
MCAC 201 : Data Structures

Time: 1 Hour

Max Marks: 20

**\*Instructions for the students**

- Time allotted for downloading the paper is 15 minutes (12:45 PM - 1:00 PM).
- Time allotted for the exam is 1 hour (1:00 PM - 2:00 PM).
- Time allotted for uploading the paper is 15 minutes (2:00 PM - 2:15 PM).
- In case of technical issues, 2nd attempt to upload the answer sheets must be made by 2.30pm
- 3rd attempt is allowed upto 2:45 PM.
- Late submission will be accepted only with screenshot proofs of all the previous failed attempts.
- Submit the answer sheet as a single pdf file.
- All questions are compulsory.

1. Given a binary search tree and two numbers L and B, give an algorithm to compute the sum of all the numbers less than L and greater than B. What is the running time of your algorithm in the worst case? What is the running time of your algorithm in the best case? Explain. Can any of them be improved?

(8)

2. Suppose a traveller Ravi decides his itinerary for a 10 day India tour and packs his clothes in a suitcase “Blue” according to the itinerary. Later he finds that the suitcase’s lock is not working and hence he needs to change his suitcase to suitcase “Red”. Help Ravi by writing an efficient recursive function Transfer\_Clothes(suitcase B, suitcase R) to transfer clothes from suitcase B to suitcase R maintaining the order of the clothes. Explain the space and time complexity of your solution.

(8)

3. Give an instance/s for the worst case of insertion sort when all elements  $\in [1,2]$ .

(4)