

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY SRI CITY

MID SEMESTER EXAMINATION – MAY, 2021

(ONLINE MODE)

DATA STRUCTURES AND ALGORITHMS

DATE: 16-05-2021

PART B - SET 1

- 1a. Explain Big-Oh asymptotic notation with appropriate example. (3 marks)
- 1b. Draw the recurrence tree for the given recurrence relation $T(n) = 2T(n-3) + 1$ and solve it using Master theorem to determine a good asymptotic upper bound. (2 marks)
- 2a. Write an algorithm and give the time and space complexity, (No need to write a C program, write a step wise solution) to find the duplicates in an unsorted array. (2 marks)
- 2b. What is the advantage of using linked lists over arrays? Explain with example. (1 mark)
- 2c. Write a C program to insert an element at the beginning of linked list. (2 marks)
- 3a. Differentiate between stack and queue. Also discuss the applications for each. (2 marks)
- 3b. Convert the given infix notation into prefix using Stack with proper explanation of each step.
$$A + (B * C - (D / E - F) * G) * H.$$
 (3 marks)