SH-III/Com. Sc.-301C-5/19

B.Sc. 3rd Semester (Honours) Examination, 2019-20

COMPUTER SCIENCE

Course ID : 31511 **Course Code : SH-CSC-301/C-5**

Course Title: Data Structures Theory

Time: 1 Hours 15 Minutes **Full Marks: 25**

The figures in the right hand side margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

The questions are equal value.

1. Answer *any five* questions: 1×5=5

(a) Distinguish between array and matrix.

(b) Cite a real life example on how to negate the stack effect.

(c) When does stack underflow occur?

(d) Draw a simply two-way linked list.

(e) What is priority queue?

(f) What is recursion?

(g) Name one of the inventors of AVL-tree.

(h) Name a searching technique for which sorting is a precondition.

2. Answer *any two* of the following questions: 5×2=10

(a) Represent the infix expression $a + b * c - d$ in postfix form. What is queue? 3+2=5

(b) Write an algorithm to evaluate a postfix expression using a stack. 5

(c) Write a recurrence relation that can generate the Fibonacci series. 5

(d) Write an algorithm for queue operations.
What is the role of return statement? 4+1=5

3. Answer *any one* question: 10×1=10

(a) Write insertion sort algorithm.
Comment in the statement "insertion sort algorithm is an online algorithm".
construct an AVL tree for the elements to be inserted one-by-one as:
March, May, November, August, April, January. 4+2+4=10

(b) Discuss the following attributes of hashing:
Hash table, Hash function, Collision and Overflow, Overflow Handling Techniques. 2+2+3+3=10

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