

SCHOOL OF INFORMATION TECHNOLOGY AND ENGINEERING

CONTINUOUS ASSESSMENT TEST - I - WINTER SEMESTER 2019-2020

Programme Name & Branch: MTECH (SE)

Course Name Code: SWE2001

Course Name: Data Structures and Algorithms

Faculty Name(s): Prof. Dharmendra Singh Rajput , Prof Angulakshmi, Prof Pradeep Kumar Roy,

Class Number(s): VI.2019205004807, VI.2019205004802, VI.2019205004818,

Exam Duration: 90 mins Maximum Marks: 50

Answer all the questions (5x10=50 Marks)

1) (a) Draw the stack structure in each case when the following operations are performed on an empty stack. [4]

(i) Add A, B, C, D, E, F

(ii) Delete two letters

(iii) Add G

(iv) Add H

(v) Delete four letters

(vi) Add I

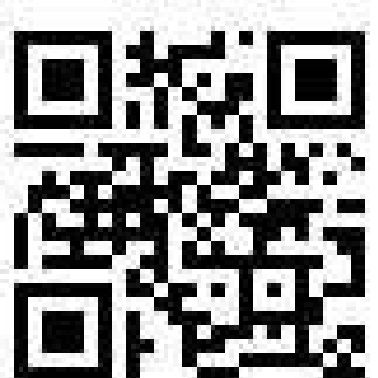
b) Write the pseudo code for push () and pop () operations. [1]

2) a) Using stack, convert the expression $(A + (B * C - (D / E ^ F) * G) * H)$ into postfix notation and illustrates the steps by using following table format as given below. [1]

Input Character/Token	Operation (PUSH/POP)	Contents of Stack	Result/Output
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(b) Evaluate the value of a Postfix expression in the following table format: $5\ 1\ 2\ +\ 4\ *\ +3\ -$

Input Character/Token	Operation (PUSH/POP)	Contents of Stack
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3 a) Explain the recursive algorithm for Tower of Hanoi problem for $N=3$ and check for its correctness. [7]

b) List out the advantages of queue data structure? [3]

4. a) Consider the circular queue of size 10 which has $FRONT = 1$ and $REAR = 5$ with input A,B, C,D,E. Show the structure of queue for the following operations on the Circular queue. [4]

- (i) Add F
- (ii) Delete two letters
- (iii) Add G
- (iv) Add H
- (v) Delete four letters
- (vi) Add I

b) Write the pseudo code for Enqueue and Dequeue operation of queue. [6]

5. (a) Write an Algorithm to search for an element in the singly linked list. [5]

(b) Write an Algorithm to find number of nodes in a singly linked list. [5]