USN:

RNS Institute of Technology
Department of CSE
III Semester - II Test - October 2020
Data Structures and Applications (18CS32)

Duration: 90 mins **Max. Marks: 50** **Time:8:30-10:00am**
Date:02-12-2020

NOTE: Answer *FIVE* full questions.
Don't write anything on question paper other than USN.

Qn. No.		Question	Marks	BCL	CO
1	a	Write a function that accepts as input a string and determines the frequency of occurrence of each of the distinct characters in the string.	6	L3	CO2
	b	Define the following: a. Stack b. Queue	4	L1	CO2
OR					
2	a	Consider struct student data, consisting of name, usn and array of marks (to store 3 subject marks). Write C statements for the following: a. To initialize a variable of student type. b. To assign a value for student type. c. To declare a pointer of type student, acquire dynamic memory and accept values for student members. d. To initialize an array of student type (array size is 2). e . To accept and swap the contents of 2 student type data.	10	L1, L5	CO2
3		Write a C program to simulate the circular queue operation, which stores data related to employee such as e_name, e_number and salary.	10	L3	CO2
OR					
4	a	Write a recursive function, to print the elements in stack from top to 0th location. Assume the following definition: int st[ ] ={1,2,3,4,5}, top=4;	6	L1	CO2
	b	Define De-queue. Compare its advantages and disadvantages with a normal queue.	4	L2	CO2
5		Convert the following infix expression to postfix using stack. i. a*(b+c)*d ii. ((a+b)*d+e)/((f+a*d)+c))	10	L1	CO2

		Show the contents of stack in each step.			
OR					
6		Convert the following infix expression to postfix using stack. i. p/b*c/d ii. a+b*d+e/f+a*d+c Show the contents of stack in each step.	10	L3	CO2
7		Write a program to simulate a circular queue using dynamic arrays.	10	L3	CO2
OR					
8	a	Explain with a suitable example how multiple stacks can be implemented using an array.	6	L1	CO2
	b	Explain precedence and associativity with respect to operators with suitable examples.	4	L1	CO2
9		Explain the analysis used to solve the maze problem.	10	L3	CO2
OR					
10		Write a program in C to find the path in a maze.	10	L3	CO2

Course Outcome (CO):

CO1: Use different types of data structures, operations and algorithms.

CO2: Apply searching and sorting operations on files