

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF INFORMATION SCIENCE
MID TERM EXAMINATION - APR 2023**

Semester : Semester II - 2022

Course Code : CSA2001

Course Name : Sem II - CSA2001 - Datastructures and Algorithms

Program : BCA,BCG&BSD

Date : 13-APR-2023

Time : 2PM - 3.30PM

Max Marks : 50

Weightage : 25%

Instructions:

- (i) Read all questions carefully and answer accordingly.*
- (ii) Question paper consists of 3 parts.*
- (iii) Scientific and non-programmable calculator are permitted.*
- (iv) Do not write any information on the question paper other than Roll Number.*

PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. List differences between static memory allocation and dynamic memory allocation
(CO1) [Knowledge]
2. Explain how to access structures members through pointers.
(CO1) [Knowledge]
3. Identify the conditions to check while inserting the values to stack and displaying the values of stack.
(CO1) [Knowledge]
4. Define Queue? List its applications
(CO1) [Knowledge]
5. Define datastructures? List the different types of datastructures
(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(4 X 5 = 20M)

6. Mr. ABC goes for shopping. Since he is a regular visitor , his details are stored in the database. Once finishing shopping all the details of cost per each item including the bill will be updated to his email. Describe how to solve the above scenario using array and pointers.
(CO1) [Comprehension]

7. Explain the concept of pop operation along with coding example.
(CO1) [Comprehension]
8. Explain the Queue underflow and Queue overflow conditions with respect to circular queue with pseudocode.
(CO1) [Comprehension]
9. An employee management system wants to store the employee information. As employees join and leave as and when they want, no prior empty records will be maintained. The main record contains the name of the employee(String), place of the employee(string), email_id of the employee(string), age of the employee(int) and gender of the employee(character). Create the user defined type with the name Employee , also write the function as how the memory can be allocated as and when the new employee has to be created.
(CO2) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

(2 X 10 = 20M)

10. Mr. ABC is working in a smart calculator product. One such application in the calculator is to check the parenthesis entered while doing calculations is balanced or not. The application uses three different kind of parenthesis (), [] and { }. Develop a C application for the device for checking, is the entered expression has balanced paranthesis or not.
(CO1) [Application]
11. For the capstone project in 4th semester Team1 decides to go for buliding a robot for hotel service system. Team leader Ms.ABC has taken the job of software development part. One application is that, the Robot has to attend the customers in the hotel. It serves the customers based on the table number. Maximum of 4 tables the Robot can serve. The robot will note down the table number depending on which it provides the service. The Robot will not take any order until the completion of the service of current 4 table. Ms.ABC has to implement the functions for recording the table number(enqueue), deleting the table number once the serive is over(dequeue), display currently the table numbers it is serving(display).
(CO1) [Application]