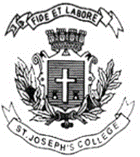
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| **ST. JOSEPH’S COLLEGE**  **(AUTONOMOUS), Bengaluru-27**  **BCA- II Semester**  **SEMESTER EXAMINATION: JULY 2022**  **CA 2121 - Data Structures Using C**  Time : 2 Hour Max Marks: 60 | | |
| **PART A: ( 1 X 10 = 10 )** | | |
| 1 | Process of removing an element from stack is called \_\_\_\_\_\_\_\_\_\_  A) Create  B) Push  C) Evaluation  D) Pop |  |
| **2** | The postfix form of the expression (A+ B)\*(C\*D- E)\*F / G is?  A) AB+ CD\*E – FG /\*\* B) AB + CD\* E – F \*\*G / C) AB + CD\* E – \*F \*G / D) AB + CDE \* – \* F \*G / |  |
| 3 | A linear collection of data elements where the linear node is given by means of pointer is called?  A) linked list B) node list C) primitive list D) None of these |  |
| 4 | Which data structure allows deleting data elements front and inserting at rear?  A) Stacks  B) Queues  C) Dequeues  D) Binary search tree |  |
| 5 | If the MAX\_SIZE is the size of the array used in the implementation of circular queue. How is rear manipulated while inserting an element in the queue? A) rear=(rear%1)+MAX\_SIZE B) rear=rear%(MAX\_SIZE+1) C) rear=(rear+1)%MAX\_SIZE D) rear=rear+(1%MAX\_SIZE) |  |
| 6 | The no of external nodes in a full binary tree with n internal nodes is? A) n B) n+1 C) 2n D) 2n + 1 |  |
| 7 | Which data structure is needed to convert infix notation to postfix notation?  A) Branch  B) Tree  C) Queue  D) Stack |  |
| 8 | In circular linked list, insertion of node requires modification of?  A) One pointer B) Two pointer C) Three pointer D) None |  |
| 9 | A circular queue is implemented using an array of size 10. The array index starts with 0, front is 5, and rear is 9. The insertion of next element takes place at the array index. A) 0 B) 7 C) 9  D) 10 |  |
| 10 | Which type of traversal of binary search tree outputs the value in sorted order?  A) Pre-order  B) In-order  C) Post-order  D) None |  |
|  | **PART B**  **Answer any 5 of the following:** | **5x4=20** |
| 11. | Using a STACK show the conversion of the following INFIX expression into a POSTFIX expression  **( A + B\*2)^3/(( C – D)\*5) + E** | 4 |
| 12. | Given the precedence of operators, write a function program to return the precedence of an operator [ ( =1, ) =2, +, - = 3, \* / = 4, ^ = 5 ] | 4 |
| 13. | Write the **algorithm** to convert an INFIX notation to **POSTFIX NOTATION**. | 4 |
| 14. | Create BINARY SEARCH from the following sequence of numbers.  **50, 40, 80, 70, 30, 20, 60, 35, 65, 75** | 4 |
| 15. | Write the function program to delete the last numberfrom a LINKED LIST. | 4 |
| 16. | Write a function sub program in C to find the sum of all even numbers in a LINKED LIST. The node of the linked list contains a Number and a link to the next node. The Head of the list is a global pointer. | 4 |
| 17. | Declare a data type to represent the node of the BINARY SEARCH TREE. Write the function to do POST ORDER TRAVERSAL | 4 |
| **PART C ( Answer any two of the following ) 2x15=30** | | |
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| 18. | 1. Given the PREORDER TRAVERSAL of a binary search tree, create the binary search tree. Show the steps involved.   **E, C, A, B , D, H, F, G, I**  b) Write a menu driven program to show the working of LINKED LIST version of a **QUEUE**. ( **Options**: Enqueue, Dequeue, DisplayQueue, Ext ) | 5  10 |
| 19. | 1. Write flowchart/pseudocode( ALGORITHM) to search for a given number in an ordered list ( Array ) using **BINARY SEARCH.**   b) Write a program in C using a stack to convert a decimal number into it’s **BINARY EQUIVALENT**. ( Declare a stack and write functions Push() and Pop(), and use them in the main program ) | 5  10 |
| 20 | 1. **Create a data type** to represent the node of a **linked list.** Use it to write a function sub program to **insert a number** into an **ORDERED LINKED LIST**. 2. Write a program in C with function sub programs to input numbers into an array, print the content of the array and sort the numbers using SELECTION SORT. Use this functions in the main program to input N numbers, print the content before and after sorting. | 5  10 |
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