

**MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL**

Paper Code : BCAC303 Data Structure and Algorithm

Time Allotted : 3 Hours

Full Marks : 70

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer any ten of the following :

[1 x 10 = 10]

- ~~(i)~~ What is the difference between a Stack and an Array?
- ~~(ii)~~ What are the disadvantages of Circular List?
- ~~(iii)~~ Which data structure is used to perform recursion?
- ~~(iv)~~ Given a Tree, is it possible to find the greatest and least among leaves in linear time?
- ~~(v)~~ Is it necessary to sort a File before searching a particular item?
- ~~(vi)~~ What is a Spanning Tree?
- ~~(vii)~~ Is it possible to implement 2 stacks in an array?
Condition: None of the stack should indicate an overflow until every slot of an array is used
- ~~(viii)~~ How many stacks are required to implement a Queue.
- ~~(ix)~~ Parenthesis is never required in Postfix or Prefix expressions. Why?
- ~~(x)~~ What actions are performed when a function is called?
- ~~(xi)~~ What do you mean by Free Pool?
- ~~(xii)~~ What is Dangling Pointer and how to avoid it?

Group-B (Short Answer Type Question)

Answer any three of the following

[5 x 3 = 15]

- ~~2.~~ Consider the following arithmetic expression P, written in postfix notation. [5]
P: 12,7,3 -/2,1,5+,*,+
Translate P, into its equivalent infix expression .
- ~~3.~~ Evaluate the postfix expression: [5]
 $623+-382/+^*2-3$
- ~~4.~~ Translate, by inspection and hand, each infix expression into its equivalent prefix expression. [5]
a) $(A-B)*(D/E)$
b) $(A+B)/(E-F)+G$
5. Write the structure of a node for linked implementation of a polynomial. [5]
6. Write a short note on priority queue. [5]

Group-C (Long Answer Type Question)

Answer any three of the following

[15 x 3 = 45]

- ~~7.~~ (a) What is hashing ? How is collision problem solved in hashing? [8]
(b) What is recursion? How does it differ from iteration? [7]
- ~~8.~~ (a) Explain row major and column major representation of two dimensional array. [5]
(b) Consider an integer array of size 3X3. The address of the first element is 1048. Calculate the address of the element at index $i = 2, j = 1$. (0 based index) [5]
(c) Write a short note on sparse matrix. [5]
9. (a) Convert the following infix expression to corresponding postfix expression: $(A+B)/C^*E+F \$G-H/(I^*J)$ [5]
(b) Write a program in Python/C to show the use of remove() and pop() function in an array. [8]
(c) What is the use of index() method in Python? [2]
- ~~10.~~ (a) Write the function for insertion operation of singly linked list. [4]
(b) Write a short note on circular linked list. [5]

- (c) Write a program In Python/ C to return the maximum and minimum number in a linked list. [6]
11. (a) How the doubly linked list can be represented? [2]
- (b) Write a program in Python/ C to delete a given node in a doubly-linked list. [8]
- (c) Where cursor implementation of list can be used? [5]

*** END OF PAPER ***

<https://www.makaut.com>
Whatsapp @ 9300930012
Send your old paper & get 10/-
अपने पुराने पेपर्स भेजे और 10 रुपये पायें,
Paytm or Google Pay से

<https://www.makaut.com>