



BRAINWARE UNIVERSITY

Term End Examination 2018 - 19

Programme – Bachelor of Computer Application

Course name – Data Structures using Python

Course Code - BCA201

(Semester – 2)

Time allotted: 3 Hours

Full Marks : 70

[The figure in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Questions)

10 x 1 =10

1. *Choose the correct alternative from the following*
 - (i) From which end items are inserted in Queue?

a. Rear	b. Top
c. Front	d. Base
 - (ii) The efficiency of an algorithm is dependent on

a. Counting microsecond	b. Number of key operations
c. Number of statement	d. Counting Kilobytes of algorithm
 - (iii) The operation of processing each element of the list is known as

a. Sorting	b. Merging
c. Inserting	d. Traversal
 - (iv) If h is any hash function and is used to hash n keys into a table of size m , where $n \leq m$, the expected number collisions for a particular key x will be

a. less than 1	b. less than m
c. less than n	d. none of these
 - (v) You have to sort a list L consisting of a sorted list followed by some random elements. Which of the following algorithm is suitable to sort L ?

a. Bubble sort	b. Selection sort
c. Insertion sort	d. Quick sort

- (vi) A full binary tree with n leaves contains
- n nodes
 - log n nodes
 - $2n-1$ nodes
 - 2^n nodes
- (vii) The searching technique that take $O(1)$ time to find a data is
- Linear search
 - Binary search
 - Hashing
 - Tree search
- (viii) Which of the following sorting method would be most suitable for sorting a list which is almost sorted?
- Bubble sort
 - Merge sort
 - Quick sort
 - Selection sort
- (ix) In a circular linked list
- Components are linked together in some sequential manners
 - There is no beginning and no end
 - Components are arranged hierarchically
 - None of these
- (x) The number of interchanges require to sort 5, 1, 6, 2, 4 in ascending order by bubble sort
- 6
 - 5
 - 7
 - 8

Group – B

(Short Answer Type Questions)

3 x 5 = 15

Answer any *three* from the following

- Consider the following queue where QUEUE is allocated 6 memory cells [5]
 FRONT = 2, REAR = 5
 QUEUE:_____, KOLKATA, ASANSOL, DELHI, MUMBAI, _____
 Describe the queue, including FRONT and REAR, as the following operations take place:
 - a city name CHENNAI is added.
 - two cities are deleted.
 - a city name KOCHI is added.
 - a city name JAIPUR is added.
 - three cities are deleted.
- Write a python program or an algorithm to insert an element in an array containing integers. Also print the final array. [5]
- Write an algorithm to implement circular queue. [5]
- (a) What is binary tree? [1]

- (b) Construct a binary tree using the In-order and post-order traversal of the node given below: [4]
Postorder : D F E B G L J K H C A
Inorder : D B F E A G C L J H K
6. Perform insertion sort for the following: [5]
 12,4,5,23,67,89,15,6,0,1

Group – C

(Long Answer Type Questions)

3 x 15 = 45

Answer any *three* from the following

7. (a) Draw an expression tree for the following expression: [5]
 A-B/C^D+E*F
- (b) Convert the following infix expression into equivalent prefix expression using stack. [10]
 $(A / B + M) * C - (D + E) / (F - G)$
 Evaluate the above expression using the given values
 A=15, B=3, M=5, C=2, D=16, E=4, F=12, G=10
8. (a) How a binary search tree differs from a binary tree? [3]
 (b) What are the applications of Stack and Queue? [2]
 (c) Write a short note on doubly ended queue. [5]
 (d) Write a python program or algorithm to perform bubble sort. [5]
9. (a) What are the advantages of linked list over array? [2]
 (b) Discuss the advantage and disadvantage of Singly Linked list over Doubly Linked List? [3]
 (c) Write an algorithm or python function to evaluate a postfix expression. [5]
 (d) Write algorithm or python function to count the item of a linked list. [5]
10. (a) What are the advantages of linked list over array? [5]
 (b) Discuss the advantage and disadvantage of Singly Linked list over Doubly Linked List? [5]
 (c) Write an algorithm or python function to evaluate a postfix expression. [5]
11. (a) Write a python program or an algorithm to insert a node at the beginning and at the end of a linked list [7]
 (b) Write a short note on doubly linked list. [5]
 (c) Differentiate between ADT and Data Structure [3]
