

**Second Year B.C.A. (Semester - I) Examination**  
**Paper - 15BCA201**  
**Data Structures**

Time: Three hours]

[ Full Marks - 60

- N.B. :**
- i) All questions carry equal marks
  - ii) Question No. 1 is compulsory
  - iii) Assume suitable data wherever necessary.
  - iv) Illustrate your answer necessary with the help of neat sketches.
  - v) Use Blue/Black ink/refill only for writing the answer book.

Q.1 Choose correct alternative and rewrite the sentences. 5

- a) Accessing each element is called \_\_\_\_
  - i) Copying
  - ii) Moving
  - iii) Deleting
  - iv) Traversing
- b) Stack are also called as \_\_\_\_
  - i) FIFO
  - ii) FILO
  - iii) LILO
  - iv) None
- c) Element added at the end of queue is referred as \_\_\_\_ pointer.
  - i) REAR
  - ii) FRONT
  - iii) TOP
  - iv) BOTTOM
- d) Operation of arranging data in some given order, such as increasing data or alphabetic data know as \_\_\_\_
  - i) Merging
  - ii) Sorting
  - iii) Traversing
  - iv) Updating
- e) The last node of linked list contains a special value known as \_\_\_\_
  - i) LINK
  - ii) SPECIAL
  - iii) NULL
  - iv) VALID

- Q.2 a) Write and explain algorithm for Bubblesort in detail. 6  
 b) Write primitive operation done on a data structure in detail. 5

OR

- Q.3 a) Write and explain algorithm for binary search in detail. 6  
 b) Explain the representation of Linear array in memory with suitable example in detail. 5
- Q.4 a) Explain basic operation perform on linked list with example in detail. 5  
 b) Write an algorithm to delete an element at the beginning of linked list with example. 6

OR

- Q.5 a) Write an algorithm to search an item in the unsorted linked list. 6  
 b) Define two-way linked list and explain its representation in memory in detail. 5
- Q.6 a) What is Stack? Write a procedure for PUSH & POP operation on stack with respect to the array representation. 6  
 b) What is Recursion? Write algorithm to calculate factorial of number. 5

OR

- Q.7 a) Convert the following Infix expression into postfix & prefix form by using stack. 6  
 $(A + B \uparrow D) / (E - F) + G$

- b) Explain algorithm for tower of Hanoi problem of n disc. 5

- Q.8 a) Write an algorithm to insert an element in queue in detail. 6  
 b) What is meant by Tree? Explain with example in detail. 5

OR

- Q.9 a) Explain Array presentation of a queue in detail. 6  
 b) Explain the linked list representation of binary tree with example. 5
- Q.10 a) Write and explain an algorithm for selection sort in detail. 6  
 b) What is Graph? Explain with example in detail. 5

OR

- Q.11 a) Write and explain an algorithm for insertion sort in detail. 6  
 b) Explain the link representation of graph with example in detail. 5

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