13. Write notes on the following (any three) :

(a) Two-way list

(b) Selection sort

(c) Sparse array with example

(d) Linear search.

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B. C. A.- III Sem.

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B. C. A. Examination, Dec. 2016

Data Structure Using C nd C++

(BCA-302)

(New Course)

Time : Three Hours] *Maximum Marks : 75*

Note : Attempt questions from all Secti s as per instructions.

Section-A

(Very Short Answer Qu tions)

Answer all the *five* questions. ch question carries 3 marks. Very short answer is r uired not exceeding 75 words. 3×5=15

1. How single dimensional arrays an be represented in computer memory ?

2. What is priority queue ?

3. Give the use of header node in linked list.

4. Differentiate between linear search and binary search technique.

5. Briefly explain complete binary tree with example.

Section-B

(Short Answer Questions)

Answer any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words. 7½×2=15

6. What is postfix expression form of any infix expression ? Write an algorithm to convert infix expression into postfix expression.

7. Write a program in C language to search a given element in linked list.

8. Explain the various types of hash functions with example.

Section-C

(Detailed Answer Quest

Answer any *three* questions out following five questions. Each question carries arks. Answer is required in detail. 15×3=45

9. What do you mean by traversal ary tree ? Give the recursive algorithm for var ypes of binary tree traversal with suitable exam

10. Explain the following terms in re with queue :
    (a) Insertion and deletion oper
    (b) Applications
    (c) Limitations and their remed

11. What is binary search tree ? Writ gram in C++ to create a binary search tree havin lements. Apply the given program on the followi a :
    –5, 10, 100, 5, –6, 1, 0

12. Explain Merge Sort with a suitab mple in detail.

12. What is binary search tree? The following list of letters are inserted into an empty binary search tree:

J R D G T E M H P A F Q

(a) Find the final tree T,

(b) Find the Post-order traversal of T.

13. Write an algorithm for heap sort and implement the algorithm to sort the following numbers:

42, 32, 52, 22, 77, 66, 88

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B.C.A. Examination, Dec.- 2017

Data Structure Using C and C++

(BCA-302)

(New Course)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from all sections as per Instructions.

Section-A

(Very Short Answer Questions)

Note : Attempt all the **five** questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words. 3×5=15

1. How a two-dimensional array is represented in memory?

2. Discuss the significance of priority queues.

3. How the end-of-list condition will be tested in a circular linked list?

4. Differentiate between preorder and post order tree traversal.

5. What is the concept of merge sorting?

Section-B

(Short Answer Questions)

Note : Answer any **two** questions out of the following **three** questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words. 7½×2=15

6. Write a program in C to insert an item of information as the first node in the linked list.

7. What is B-tree? How do you construct the B-tree? Explain with example.

8. What do you mean by linear search? Discuss the complexity of linear search.

Section-C

(Detailed Answer Question

Note : Answer any **three** questions following **five** questions. Eac carries 15 marks. Answer is detail.

t of the question uired in 5×3=45

9. Discuss the following with exam :

(a) Lower triangular matrix

(b) Upper triangular matrix

(c) Tridiagonal matrix

10. How a stack is represented in array? Describe the various application stacks. Explain prefix, infix and postfix ex ssions with the help of examples.

11. Write an algorithm to delete e K^{th} node from a two-way linked list. E in the algorithm by taking an example.

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12. Write a program to print a given singly linked list in the reverse order.

13. Write short notes on the following :

(a) Priority Queues

(b) Hashing Techniques.

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B. C. A. Examination, Dec. 2018

Data Structure Using C and C++

(BCA-302)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Answer all the *five* questions. Each question carries 3 marks. Very short answer is required. 3×5=15

1. What are AVL trees ?

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2. What do you understand by Data Structure ?

3. What is an array ? Explain.

4. Give the application of stack.

5. Define circular list and chain.

Section-B

(Short Answer Questions)

Answer any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required. 7½×2=15

6. Write the procedure to delete an element from an array.

7. Write a recursive function to count the number of leaves in a binary tree.

8. Write a function to reverse a stack using push and pop operation.

Section-C

(Detailed Answer Questions)

Answer any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. 15×3=45

9. (a) How to delete an element from a linked queue ? Write procedure.
   (b) Find the time complexity of Bubble Sort Algorithm.

10. (a) What is Binary search tree ?
    (b) What is a B-tree ?

11. (a) Write a function to evaluate a postfix expression. Show status of stack for each scanned token if the postfix expression is :

    ABC * DEF $/- G+H* –

    (b) Differentiate between stacks and queues.

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B.C.A. Examination, November-2019

DATA STRUCTURE USING C AND C++

(BCA-302)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from ***all*** sections as per instructions.

Section–A

(Very Short Answer Questions)

Note : Attempt all the ***five*** questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words. 5×3=15

1. Write the limitations of arrays.
2. Define stacks and queues with an example.
3. What is the advantage of a header node in a linked list ?
4. How a binary tree is traversed in C language ?

5. What is the basic concept of insertion sorting ?

Section–B

(Short Answer Questions)

Note: Answer any ***two*** questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words. 2×7½=15

6. What do you mean by sparse matrix ? Explain how a sparse matrix is represented in memory.

7. What is D-queue ? Explain the insertion and deletion operations with the help of suitable example.

8. Write an algorithm to delete last node from a linked list.

Section–C

(Detailed Answer Questions)

Note: Attempt any ***three*** questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. 3×15=45

9. Write algorithm and its C syntax to insert an element at the K^{th} position into the linear array.

10. Write an algorithm to evaluate postfix expression and also implement the algorithm to the following expression :

    3, 1, +, 2, ↑, 7, 4, –, 2, * , +, 5, –

11. Write algorithm to perform insertion and deletion operations on binary trees and explain them with an example.

12. Describe hashing and various hashing techniques in detail.

13. Explain the following :

    (i) Priority Queues

    (ii) Heap Sort

    (iii) Applications of Binary Search Tree

3. Write prefix & postfix form for A+B *(C-D) / (E-F) 3

4. Design a recursive factorial function using C/C++ language. 3

5. Explain the term Hashing. 3

Section - B

(Short Answer Questions)

Note: Attempt any **two** questions.2×7½=15

6. Describe the types of sparse matrix. How can we store a 2D sparse matrix in a corresponding single dimensional array? Find the formula for address calculation. 7½

7. Explain D-Queue & priority queue with a suitable example. 7½

8. Write a program in C/C++ to multiply two matrices A & B. 7½

Section - C

(Detailed Answer Questions)

Note: Attempt any **three** questions.3×15=45

9. (a) Perform Quick sort operation on given numbers. 15

66, 35, 48, 55, 62, 77, 25, 38, 18, 40, 30, 20.

(b) Apply Bubble sort on DATASTRUCTURES.

10. Discuss the programming code in C/C++ language to create, insert & delete the elements in a singly linked list. 15

11. Explain the properties of B-Trees. Also create a B-Tree of order 3 for following data. 15

Jan, Feb, Mar, Apr, May,Jun, Jul, Aug, Sep, Oct, Nov, Dec.

12. (a) Create a Heap tree with the following element. 15

95, 13, 12, 71, 96, 10, 62, 43, 35, 38.

(b) Make a Binary search tree for given data.

14, 15, 4, 9, 7, 18, 3, 5, 16, 4, 20, 17, 9, 14, 5.

13. (a) Design a function CQINSERT for static implementation of circular queue. 15

(b) Differentiate linear & Binary search with suitable example.

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B.C.A.-III Sem.

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B.C.A. Examination, Dec.-2020

DATA STRUCTURE USING C AND C++

(BCA-302)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from **all** sections as per instructions.

Section- A

(Very Short Answer Questions)

Note : Attempt **all** questions. 3×5=15

1. Explain the data structure's operations. 3
2. How can we minimize the stack overflow? 3

P.T.O.