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(201217) Roll No.

B.C.A. - III Sem.

18012

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. $3 \times 5 = 15$

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

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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 $7\frac{1}{2}$ marks. Short answer is required not exceeding 200 words. $7\frac{1}{2} \times 2 = 15$

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.

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Section-C

(Detailed Answer Question)

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

9. Discuss the following with examples:
 - (a) Lower triangular matrix
 - (b) Upper triangular matrix
 - (c) Tridiagonal matrix
10. How a stack is represented in an array? Describe the various applications of stacks. Explain prefix, infix and postfix expressions with the help of examples.
11. Write an algorithm to delete the K^{th} node from a two-way linked list. Explain the algorithm by taking an example.

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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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