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| **ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27** |
| **B.C.A - II SEMESTER** |
| **SEMESTER EXAMINATION: APRIL 2018** |
| **CA 2115 - Data Structures Using C** |
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| **Time- 2 1/2 hrs** |  |  **Max Marks-70** |  |
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| This question paper has two printed pages(For supplementary candidates)Do not write the register number on the question paperPlease attach the question paper along with the answer script.**I. Answer all the following 10\*2=20 Marks**1. Explain primitive data structures with examples.
2. Explain any two operations on non-primitive data structures.
3. Define Big O notation.
4. What are the advantages of circular queues over linear queue.
5. Explain static memory allocation.
6. What is meant by doubly circular link list? Give an example.
7. What is linear search?Mention the advantages and disadvantages.
8. Give the complexity analysis of selection sorting.
9. Define full binary tree with an example.
10. What is a node in a tree? Mention the different types of node.
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**II.Answer any five of the following: 5\*6=30 Marks**

1. Explain the two important requirements of an algorithm with examples.
2. Define stack. Write algorithms to explain the operation associated with it .
3. Write and explain the algorithm to insert an element into a circular queue.
4. Define a node and write an algorithm to create a link list.
5. Write an algorithm to sort the elements in ascending order using insertion sort.
6. Write an algorithm for binary search and explain its time complexity.
7. Define
8. Blocking factor **2 Marks**
9. Binary tree **2 Marks**
10. AVL Rotation. **2 Marks**

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**III.Answer any two of the following 2\*10=20 Marks**

1. A) Write the algorithm to convert infix expression to postfix expression. **5 Marks**

B) Evaluate the given postfix expression **10,3,2, \*,+,6,2,/ 5 Marks**

1. Write and explain the algorithm to insert and delete an element from a linear queue.

1. A) Write the algorithm to draw a binary tree given the in-order and

 pre-order form. **4 marks**

 B) Draw a binary tree given

 In-order ->D B E A F C G

 Pre-order -> A B D E C F G **3 Marks**

 C)

Find the in-order, pre-order and post-order of the above given binary tree. **3 Marks**