

Code: 17F00201

MCA II Semester Regular Examinations June/July 2018

**DATA STRUCTURES**

(For students admitted in 2017 only)

Time: 3 hours

Max. Marks: 60

Answer all the questions

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- 1 (a) What are the criteria to follow to judge a program? Explain space and time complexity in detail.
- (b) What is performance measurement? Explain.

**OR**

- 2 (a) Write an iterative function to compute a binomial coefficient and then transform it into an equivalent recursive function?
- (b) Determine the space complexity of the iterative and recursive binomial coefficient functions.

- 3 (a) Write the difference between arrays and structures. Explain self-referential structures with suitable example.
- (b) Define pattern matching. Demonstrate the Knuth, Morris, Pattern (KMP) matching algorithm.

**OR**

- 4 (a) Explain ADT stack and ADT queue operations and functions with proper pseudo code.
- (b) Write the postfix form of the following expression:  
 $(a+b)*d+e/(f+a*d)+c$

- 5 Briefly discuss various types of linked lists and explain the major operations of linked lists.

**OR**

- 6 (a) How to represent polynomials? Explain circular list representation of polynomials.
  - (b) Write a program to implement circular queue operations by using linked lists.
- 7 (a) Define binary tree. Explain binary tree representations with neat diagrams.
  - (b) Write a C function to delete the element with key k from a binary search tree and evaluate the time complexity of your function.

**OR**

- 8 Illustrate binary tree traversals in detail with suitable pseudo code for each traversal.

- 9 Explain the following searching techniques:  
(i) Linear search. (ii) Interpolation search. (iii) Fibonacci search.

**OR**

- 10 (a) Quick sort is an unstable sorting method. Give an example of an input list in which the order of records with equal keys is not preserved.
- (b) Write the steps to implement **k-way merge** with floating buffers.

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