

Department of Higher Education
University of Computer Studies, Yangon
First Year (B.C.Sc./B.C.Tech.)
Data Structure (CST-103)
Final Examination
October, 2018

Answer ALL questions.

Time Allowed: 3 hours.

1. Define **Any Five** of the followings: (10 marks)
- | | |
|----------------------|-------------------------------|
| (a) Algorithm | (b) Linear data structure |
| (c) Contiguous stack | (d) Recurrence |
| (e) Queue | (f) Dynamic memory allocation |
2. (a) Define algorithm and Explain the essential properties and the performance measures of an algorithm.
- (b) Explain primitive and non-primitive data structure with example.
- (c) Which formula is used to calculate the address of the i^{th} element of an array? The array data [10, 25] is stored in memory in row-major order. If the base address is 500 and element size is 4, calculate the address of the element data [7, 12]. (20 marks)
3. (a) Write a short note on Use of stack in function calls. (20 marks)
- (b) Write an algorithm which illustrates the prefix to postfix conversion.
- (c) Convert the following infix expression to its prefix form: (Illustrate your answer using table.)
- | |
|--|
| (i) $A \wedge B \times C - C + D / A / (E + F)$ |
| (ii) $A \times (B + D) / E - F \times (G + H / K)$ |
4. (a) What are the important things to notice when creating a recursive function? (20 marks)
- (b) Discuss direct recursion with examples.
- (c) In binary search, the given key is compared with the middle element of an array. If a match occurs, the search is successful; else the comparison decides whether the search would be restricted to either the upper half or the lower half of the array. Write a recursive function Binary(key, A, n), where n is the size of the array A.
5. (a) List the operations performed on the priority queue. (20 marks)
- (b) Write a C++ program to insert an element in the circular queue. Write a C++ function for printing the elements of the queue in reverse order.
6. (a) What are the basic operations associated with the link list? (10 marks)
- (b) Why a linked list is called a dynamic data structure? What are the advantages of using linked lists over arrays?
