

National College of Ireland

Higher Diploma in Science in Computing – Part-time – Year 1 – HDCSDEV

Semester Two Examinations – 2015/16

Saturday 7th May 2016
10.00am – 12.00pm

Data Structures and Algorithms

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Answer ALL 3 Questions. Questions DO NOT carry equal marks.

Duration of exam: 2 Hours

Attachments: None

Question 1.

- (a) Write out the class for a Double Link Object. Only the instance vars and constructor is required. [5]
- (b) Assuming the existence of a Double Linked List class, write out the display method for a Double Linked List Object. [10]
- (c) Write out the deleteLink() method for the Double Linked List class. [15]

Question 2.

- (a) Write out the inOrderTraverse() method for the Binary Tree class. [10]
- (b) Create a sample tree with a root and one other node. Trace through the inOrderTraverse in your own words. [10]
- (c) Write out the addNode() method for the Binary Tree Class. [15]

Question 3.

- (a) Write a note about the efficiencies of three sorting algorithms you know. Make reference to BigO notation in your answer. [10]
- (b) Taking a small array of four integers, do a trace through of the BubbleSort algorithm. The array must be initially unordered [10]
- (c) Write out a BubbleSort() method. [15]