2. (a) (i) Describe how to carry out the first pass of a bubble sort when it is used to sort a list of n numbers into ascending order.

(ii) Write down the circumstances under which a bubble sort stops.

(4)

A bubble sort, starting at the left-hand end of the list, is used to sort a list of ten numbers into ascending order. After a number of passes the list reads

0.9 1.2 1.5 0.5 1.4 1.1 0.7 1.7 2.2 3.2

(b) Determine the maximum number of passes that could have taken place on this list. You must give a reason for your answer.

(2)

(c) Complete the bubble sort to produce a list of the numbers in ascending order. You only need to give the state of the list after each complete pass.

(4)

(d) Use the first-fit decreasing bin packing algorithm to determine how the ten numbers listed above can be packed into bins of size 4

(3)

(Total 13 marks)