4.

35 17 10 7 28 23 41 15 20 29

(a) Use the first-fit bin packing algorithm to determine how the numbers listed above can be packed into bins of size 60

(3)

(b) The list of numbers is to be sorted into descending order. Use a quick sort to obtain the sorted list. You should show the result of each pass and identify your pivots clearly.

(4)

(c) Use the first-fit decreasing bin packing algorithm on your ordered list to pack the numbers into bins of size 60

(3)

The ten distinct numbers below are to be sorted into descending order.

20 24 17 26 8 15 x y 19 12

A bubble sort, starting at the left-hand end of the list, is to be used to obtain the sorted list.

After the second complete pass the list is

24 26 20 17 15 y 19 12 x 8

(d) Find the constraints on the values of x and y.

(3)

(Total 13 marks)