Question 15 (8 marks)
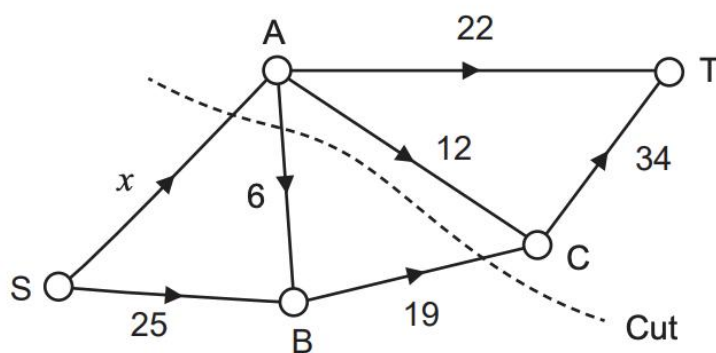
The graph below shows a network of sewage pipes. The numbers on the edges indicate the number of litres per minute that can flow along each pipe.

Diagram 1

(a)   Show that the value of x is 38, given that the value of the cut is 57. (2 marks)

(b)   Calculate the value of the maximum flow through the network. (2 marks)

(c)   Indicate on **Diagram 2** below a possible flow along each pipe corresponding to the maximum flow calculated in part (b).   (2 marks)
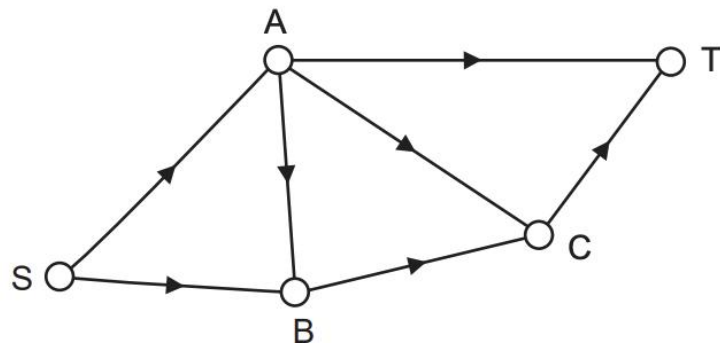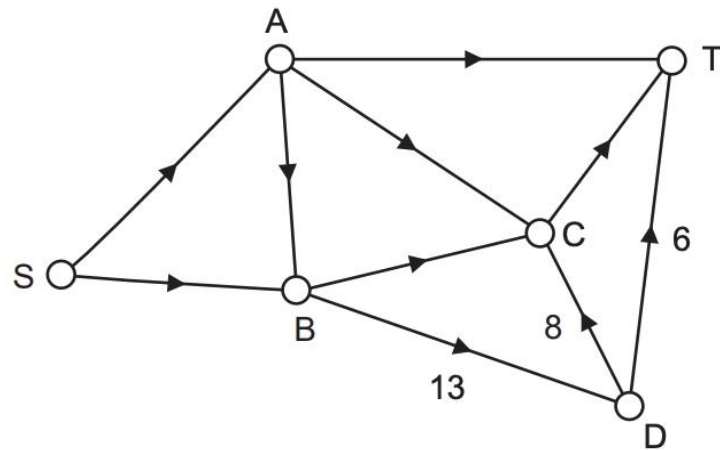

Diagram 2

Extra pipes, BD, DC and DT, are added to form a new system shown below. The capacities of the new pipes are indicated on the diagram. The original pipes have the same capacity as shown in **Diagram 1**.

(d)   How will the addition of these pipes affect the new maximum flow through the system?

(2 marks)