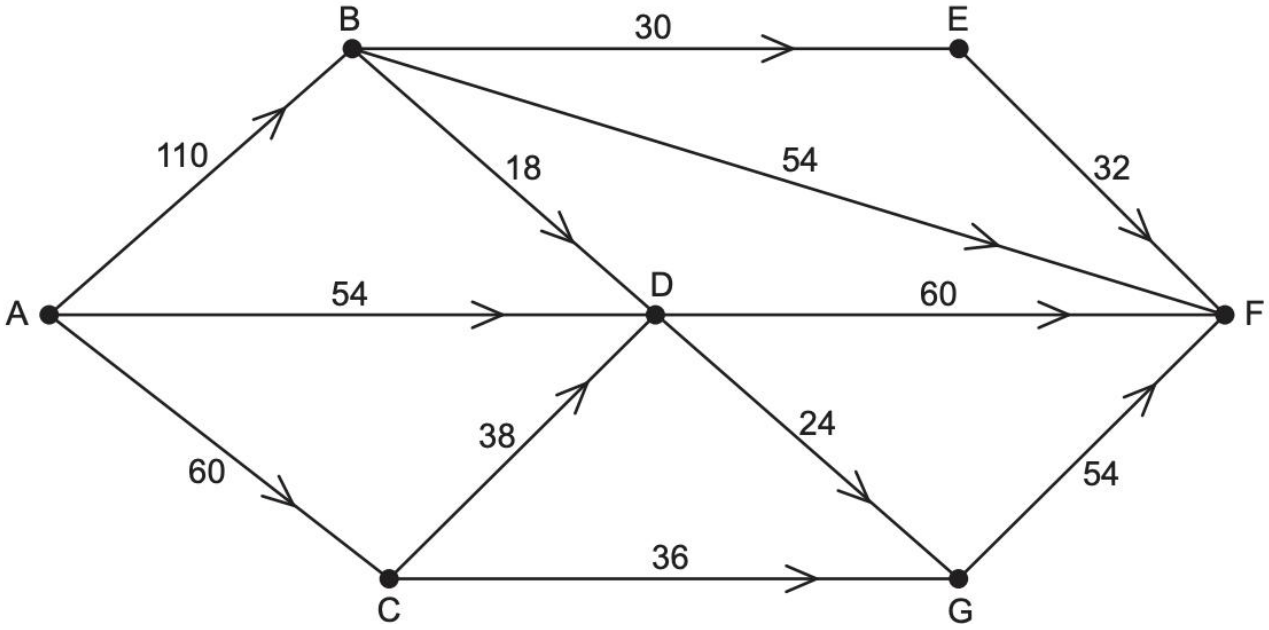
Question 11 **(10 marks)**

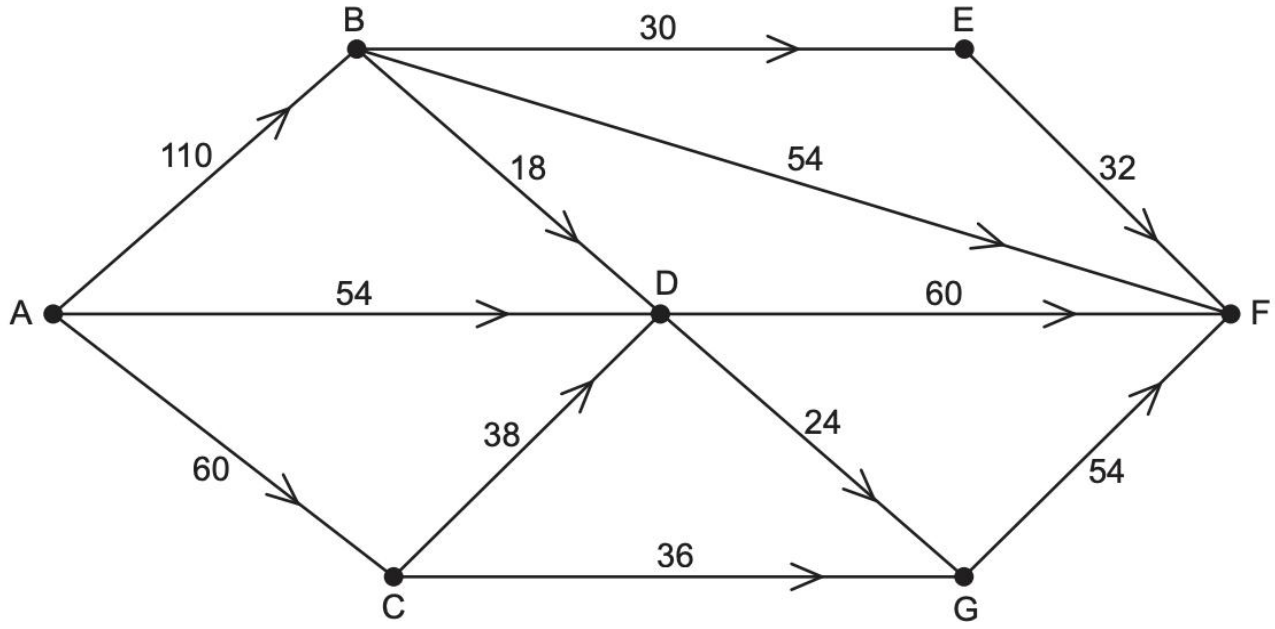
A ferry service connects a group of islands in the Pacific Ocean.

(a) The network below is for the hourly departures from A and shows the number of passengers that can be carried between each island, A, B, C, D, E, F and G. Determine the maximum number of passengers that can be carried from A to F each hour. Show systematic workings. (4 marks)

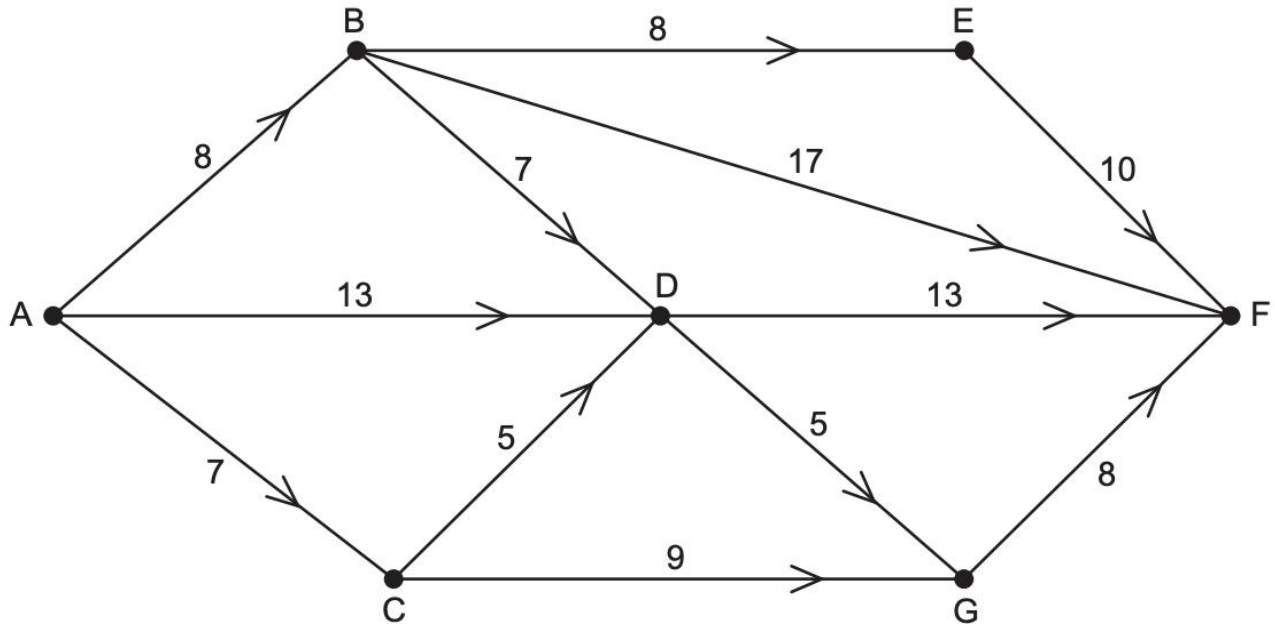


(b) On the network below, draw the minimum cut that corresponds to the maximum flow determined in part(a).

(1 mark)



(c) The network below shows the distance in kilometres between the islands. Ferry passengers are charged a $10 booking fee plus $1.50 for each kilometre they plan to travel. Calculate the minimum cost of travelling from A to F. (3 marks)



(d) During the off-season when there are fewer passengers, the ferry company will only maintain the services that form the minimum spanning tree. On the network below, highlight clearly the services that will be maintained. (2 marks)