5.

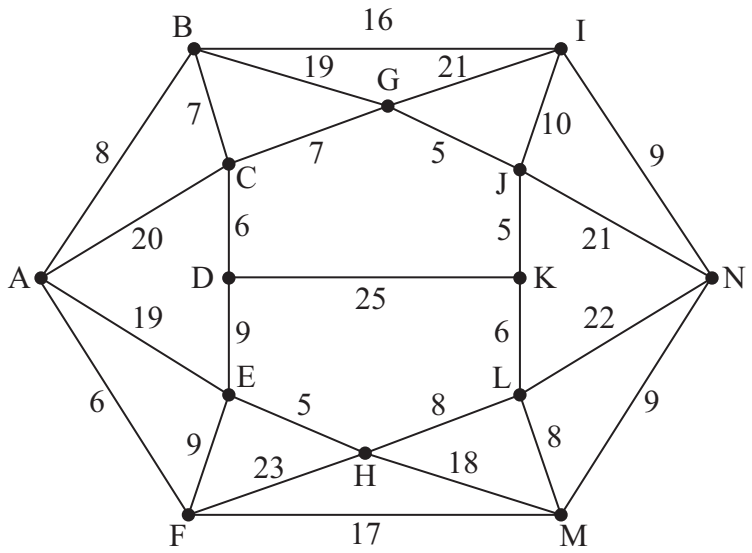


Figure 3

[Total weight of network = 338]

Figure 3 shows the roads between 14 towns. The number on each arc represents the distance, in kilometres, along the corresponding road.

(a) State, with a reason, whether the network is Eulerian, semi-Eulerian or neither.

(1)

The roads between the towns need to be inspected. Jose must travel along each road at least once. He wishes to minimise the length of his inspection route. Jose will start and finish his inspection route at A.

(b) (i) Determine the length of Jose's route.

(ii) State the roads that Jose must repeat.

(3)

Jose now decides to start his inspection route at A and finish at N. He must still minimise the length of his route and travel along each road at least once.

(c) (i) By considering the pairings of all relevant nodes, determine the length of Jose's route.

(ii) State the roads that he must repeat.

(5)

(Total for Question 5 is 9 marks)