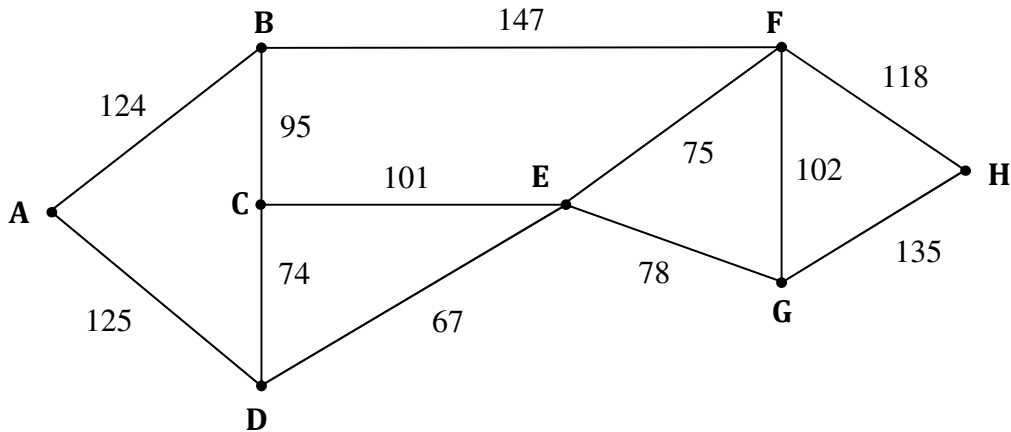


Route Inspection Problems

1.



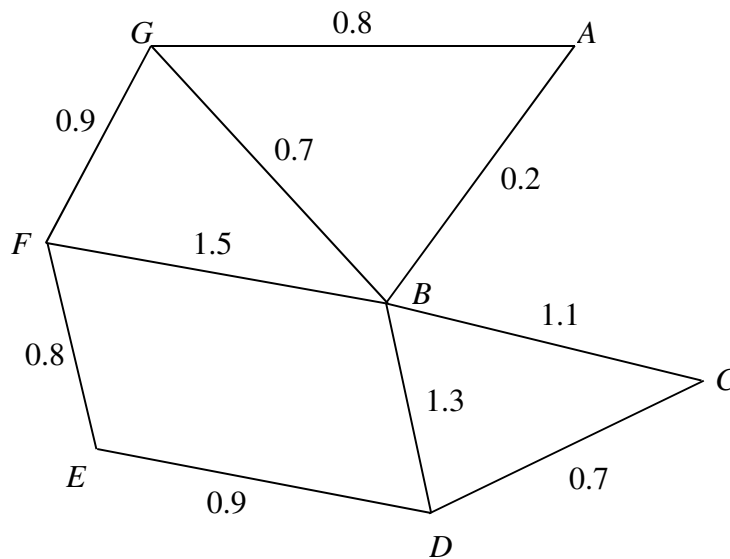
The diagram shows a network of paths. The number on each arc gives the distance, in metres, of that path.

Solve the route inspection problem for the network shown. You should make your method and working clear. State a shortest route, starting at A, and find its length.

[The total weight of the network is 1241]

(5 marks)

2.



An engineer needs to check the state of a number of roads to see whether they need resurfacing. The roads that need to be checked are represented by the arcs in Fig. 2. The number on each arc represents the length of that road in km. To check all the roads, he needs to travel along each road at least once. He wishes to minimise the total distance travelled.

The engineer's office is at G, so he starts and ends his journey at G.

(a) Use an appropriate algorithm to find a route for the engineer to follow. State your route and its length. **(5 marks)**

The engineer lives at D. He believes he can reduce the distance travelled by starting from home and inspecting all the roads on the way to his office at G.

(b) State whether the engineer is correct in his belief. If so, calculate how much shorter his new route is. If not, explain why not. **(3 marks)**

