2.

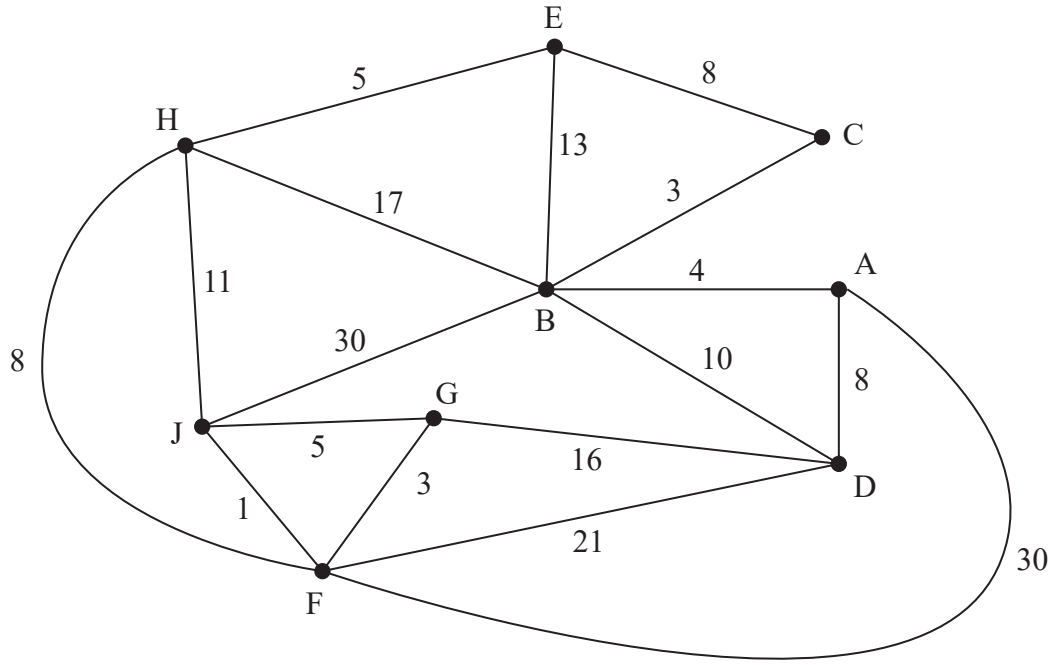


Figure 1

[*The total weight of the network is* 193]

Figure 1 represents a network of roads. The number on each edge represents the length, in miles, of the corresponding road. Jan wishes to travel from A to J. She wishes to minimise the distance she travels.

(a) Use Dijkstra's algorithm to find the shortest path from A to J. Obtain the shortest path and state its length.

(6)

On Monday, Jan needs to travel from her gym at J to her home at H via her office at A.

(b) State the shortest path from J to H via A and its length.

(2)

On Tuesday, Jan needs to check each road. She must travel along each road at least once. Jan must start and finish at A.

(c) Use the route inspection algorithm to find the length of the shortest inspection route. State the roads that should be repeated. You should make your method and working clear.

(5)

On Wednesday, Jan decides to start her inspection route at G but can finish her route at a different node. The inspection route must still traverse each road at least once.

(d) Determine where the route should finish so that the length of the inspection route is minimised. You must give reasons for your answer and state the length of the route.

(3)

(Total for Question 2 is 16 marks)