

6.

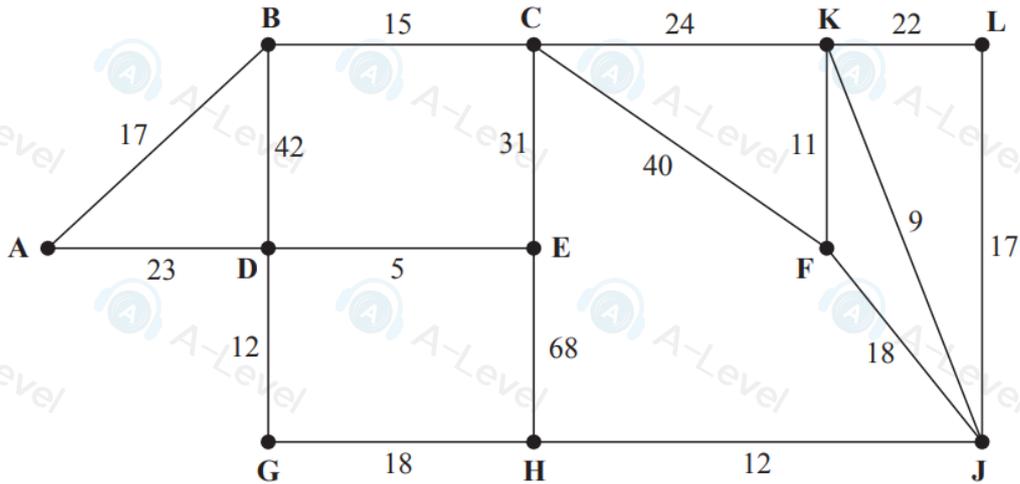


Figure 5

[The total weight of the network is 384]

Figure 5 models a network of corridors in an office complex that need to be inspected by a security guard. The number on each arc is the length, in metres, of the corresponding section of corridor.

Each corridor must be traversed at least once and the length of the inspection route must be minimised. The guard must start and finish at vertex A.

- (a) Use the route inspection algorithm to find the length of the shortest inspection route. State the arcs that should be repeated. You should make your method and working clear. (5)

It is now possible for the guard to start at one vertex and finish at a different vertex. An inspection route that traverses each corridor at least once is still required.

- (b) Explain why the inspection route should start at a vertex with odd degree. (2)

The guard decides to start the inspection route at F and the length of the inspection route must still be minimised.

- (c) Determine where the guard should finish. You must give reasons for your answer. (2)

- (d) State a possible route and its length. (2)

(Total 11 marks)

5.

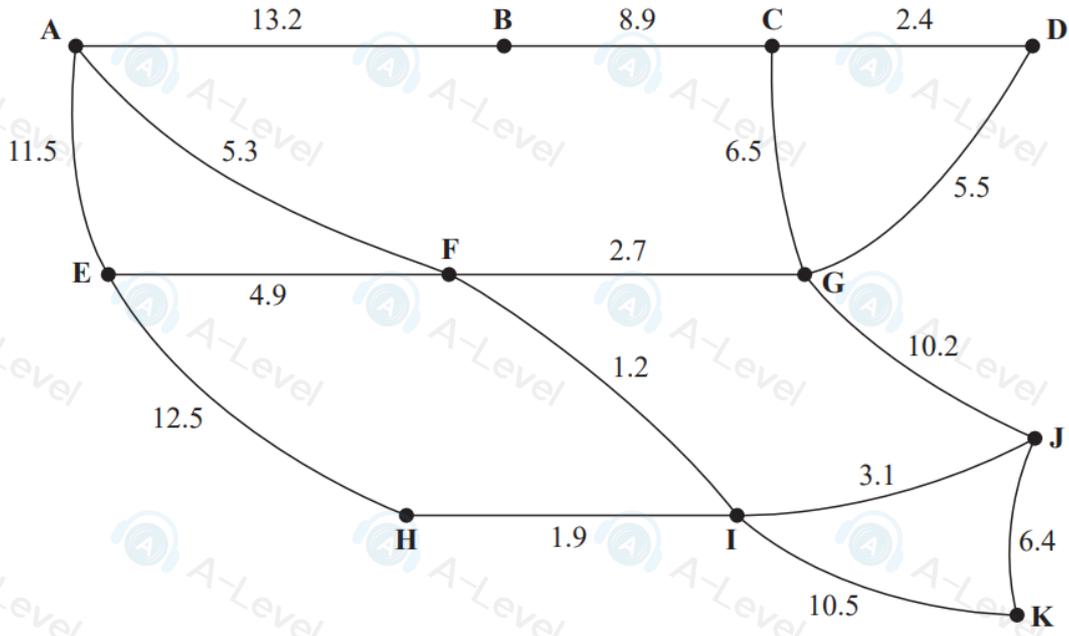


Figure 3

[The total weight of the network is 106.7]

Figure 3 models a network of cycle tracks that have to be inspected. The number on each arc represents the length, in km, of the corresponding track. Angela needs to travel along each cycle track at least once and wishes to minimise the length of her inspection route. She must start and finish at A.

- Use an appropriate algorithm to find the tracks that will need to be traversed twice. You should make your method and working clear. (5)
- Find a route of minimum length, starting and finishing at A. State the length of your route. (2)

A new cycle track, AC, is under construction. It will be 15 km long. Angela will have to include this new track in her inspection route.

- State the effect this new track will have on the total length of her route. Justify your answer. (2)

(Total 9 marks)

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Question 5 continued

Handwriting practice area consisting of 20 horizontal lines for writing.

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Q5

(Total 9 marks)



P 4 8 3 4 6 A 0 1 3 2 0

5.

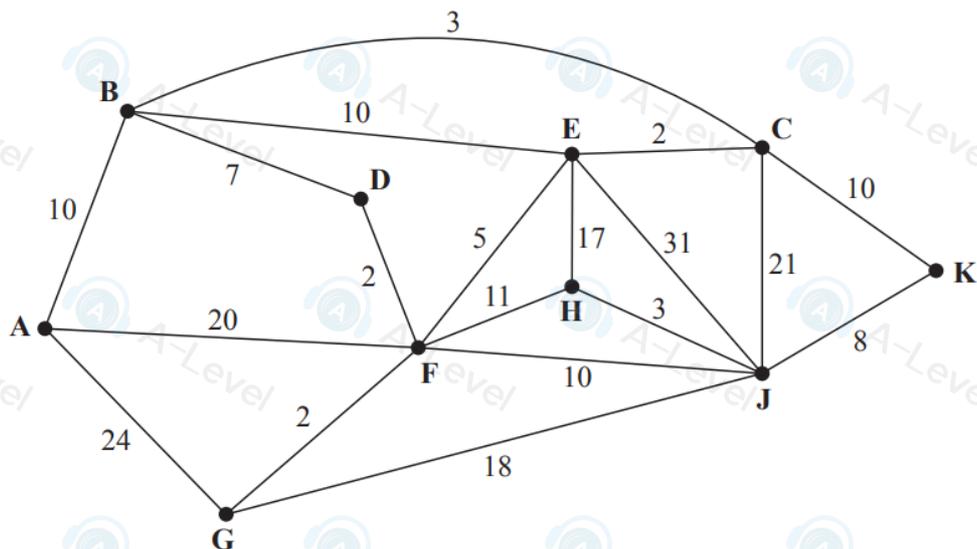


Figure 5

[The total weight of the network is 214]

Figure 5 models a network of canals that have to be inspected. The number on each arc represents the length, in km, of the corresponding canal. Priya needs to travel along each canal at least once and wishes to minimise the length of her inspection route.

She must start and finish at A.

- (a) Use the route inspection algorithm to find the length of her route. State the arcs that will need to be traversed twice. You should make your method and working clear. (6)

- (b) State the number of times that vertex F would appear in Priya's route. (1)

It is now decided to start the inspection route at H. The route must still travel along each canal at least once but may finish at any vertex.

- (c) Determine the finishing point so that the length of the route is minimised. You must give reasons for your answer and state the length of the minimum route. (3)

(Total 10 marks)