Interpreting the practicality of a solution

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. A 12 dollars route uses a closed bridge. The cheapest permitted route costs 15 dollars. Which is recommended? [2 marks]

The cheaper route is infeasible.

Optimise only over permitted routes.

Answer: The 15 dollars route.

2. A flow network uses L/s but demand is 720 L/min. Convert demand. [2 marks]

There are 60 seconds per minute.

$\frac{720}{60} = 12$.

Answer: 12 L/s.

3. A cable model weights edges by distance and ignores rocky terrain. Suggest a specific improvement. [2 marks]

Equal distances can cost different amounts to excavate.

Costs better match a cost-minimisation objective.

Answer: Use terrain-dependent installation costs as edge weights.

4. Trees cost 9,200 dollars and 9,250 dollars based on edge estimates rounded to 100 dollars. Explain the uncertain ranking. [2 marks]

Several edge values may vary inside their rounding intervals.

Obtain better estimates or test sensitivity.

Answer: The 50 dollars difference may be smaller than estimation error.

5. Maximum flow is 40 units/hour and demand is 45. Is the system adequate? [2 marks]

$45 - 40 = 5.$

Demand exceeds capacity.

Answer: No; it is short by 5 units/hour.

6. A subtotal of 180 dollars excludes one fixed 25 dollars delivery fee. State the corrected total and assumption. [2 marks]

$180 + 25 = 205.$

Add the fixed fee once, not for every product.

Answer: 205 dollars assuming one delivery and no other charges.