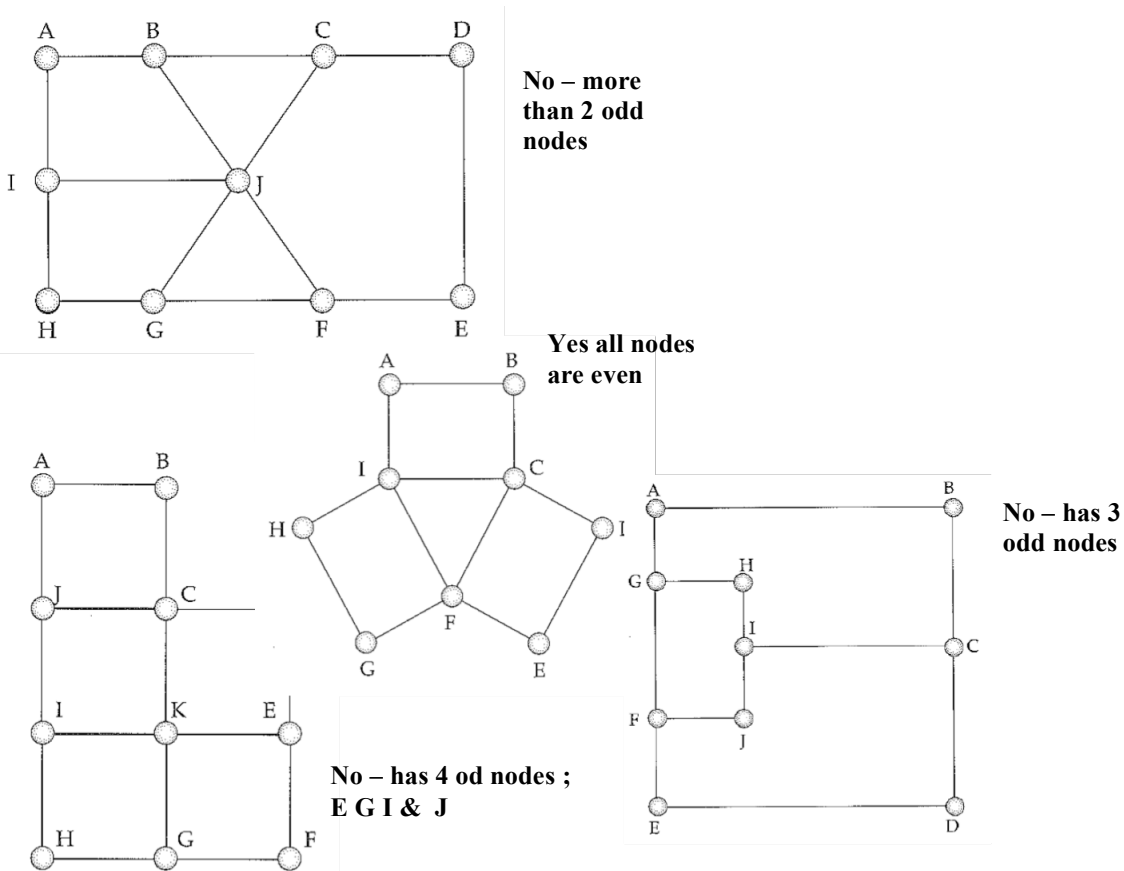


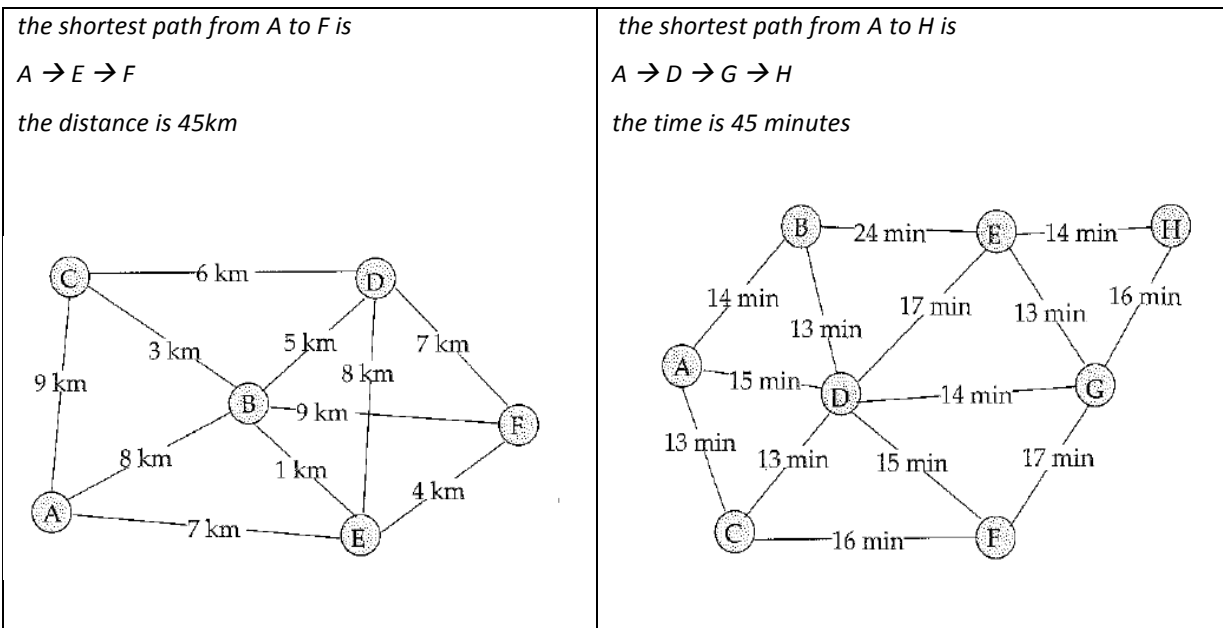
Page 5

YES, Courier driver can drive along each road once as there are exactly two odd nodes, D & G
 One possible route is G-A-B-C-D-B-E-G-F-E-D

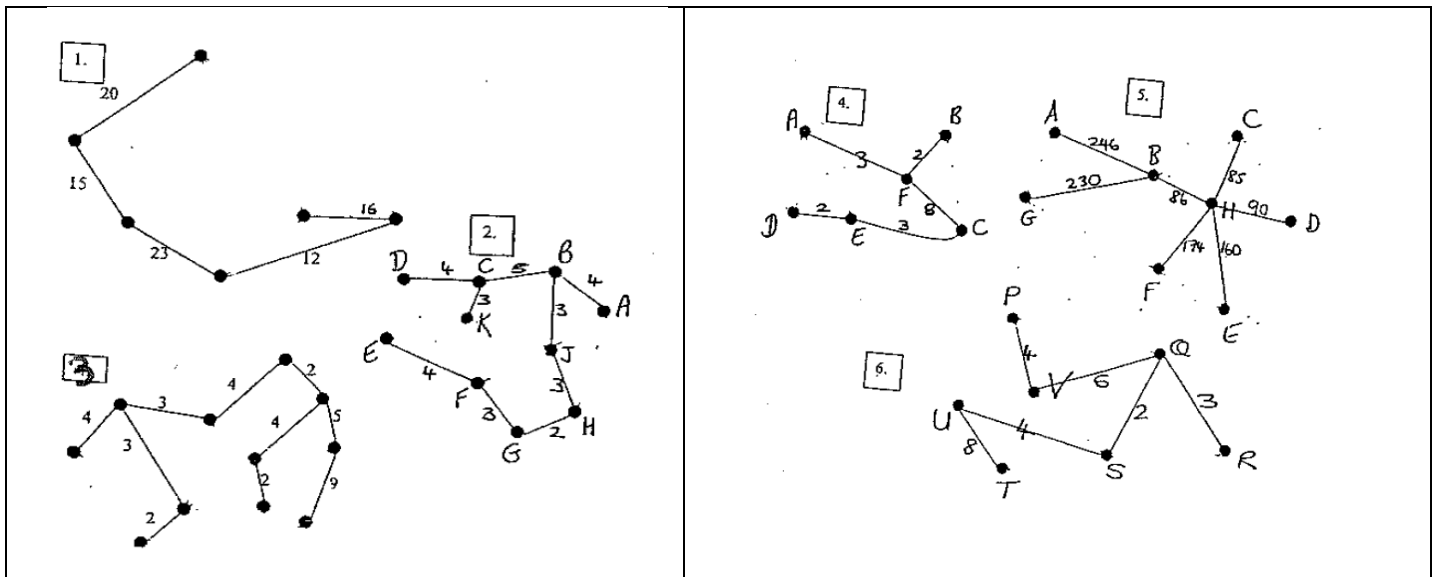
Page 6: Traversability



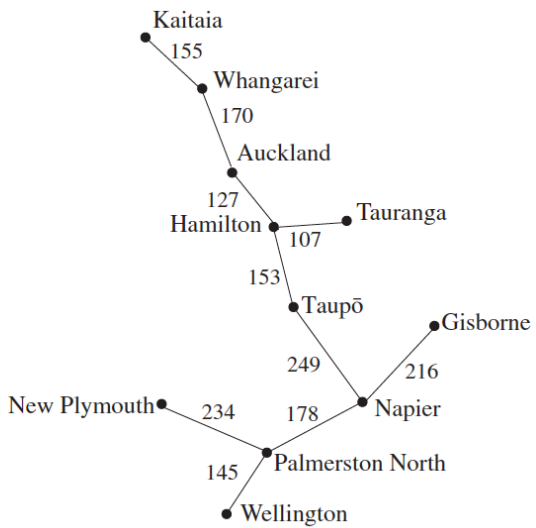
Page 8: Shortest Path



Page 11: Minimum Spanning Tree

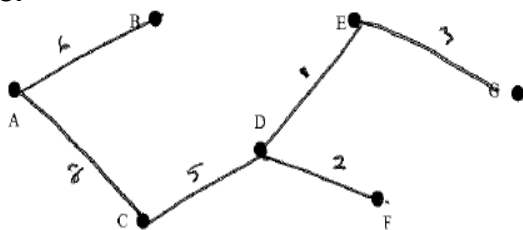


Page 12 Brilliant



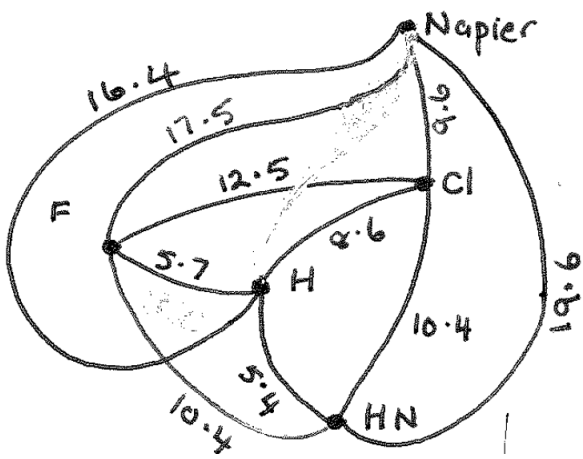
Minimum length of Brilliant Thread is 1734 km

Page 13 ISP

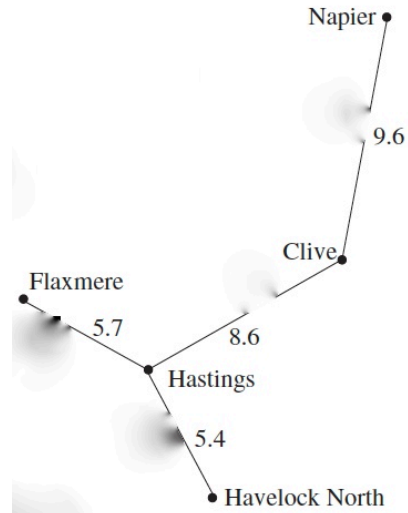


Total cost is $6+8+5+2+1+3=25$
 Total Cost is 25 million dollars

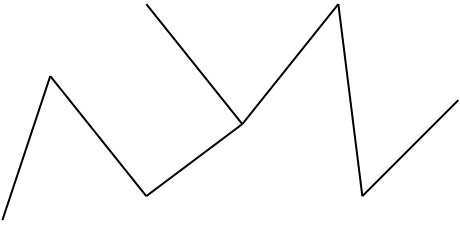
Page 14: Drawing a network



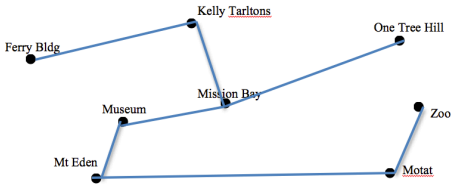
Least amount of line is 29.3km
The cost of connecting the lines is \$293 000



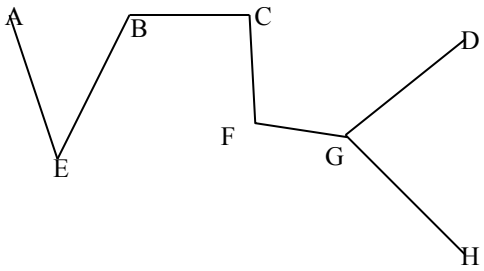
P 15 The Zoo

| Situation | Evidence | Judgement |
|-----------------------|---|---|
| Shortest Path | Minimum Length = 50 m Shortest Path S → E → K → Z → O | Require both minimum length and correct path |
| Minimum Spanning Tree | Lines as in diagram below  Arcs: CS, SE, EK, KP, KZ, ZO, OM Minimum length wire = 90m | Require both: correct links and minimum length of wire |
| Traversability | The network is only traversable if it has 0 or 2 odd nodes. Design A is not traversable because it has 4 odd nodes. Design B is traversable because it has exactly 2 odd nodes and the rest are even. | Answer required with justification Must mention condition for traversability and refer to the order of the nodes (odd vs. even). |

P17 The Party Bus Company

| Situation | Evidence | Judgement |
|-----------------------|--|---|
| Shortest Path | Shortest route Ferry Building → Museum → Mt Eden → Motat Minimum Length 21 | Require both correct path And minimum Length |
| Minimum Spanning Tree | Lines as in diagram below  Minimum distance = 41km | Require both: correct links and minimum distance |
| Traversability | The network is only traversable if it has exactly 2 odd nodes or all nodes are even Design A is traversable because it has exactly 2 odd nodes. Design B is not traversable because it has 4 odd nodes | Answer required with justification Must mention condition for traversability and refer to the order of the nodes (odd vs. even). |

P 19 Fiordland National Park

| Situation | Evidence | Judgement |
|-----------------------|---|--|
| Shortest Path | Shortest route BEGH Minimum Length 79 | Require both correct path And minimum Length |
| Traversability | No it is not traversable. The network is only traversable if it has 0 or 2 odd nodes. There are four odd nodes in this network | Answer required Must mention condition for traversability |
| Minimum Spanning Tree | Lines as in diagram below  Arcs: AE, BE, BC, CF, FG, GD, GH Minimum length track = 170 km | Require both correct links and minimum length of track |