



QUESTION WORKBOOK

The travelling salesman problem

Decision Mathematics 1 · Year FM

6 questions · 20 marks

PRINT EDITION

SECTION A · Warm-up

- A1** State the difference between the practical and classical travelling salesman problems, and how one is turned into the other. [2]

- A2** Apply the nearest neighbour algorithm from A to the network with AB 20, AC 35, AD 42, AE 25, BC 30, BD 34, BE 28, CD 12, CE 40, DE 22. [3]

SECTION B · Standard

- B1** Find a lower bound for the same network by deleting A. [4]

- B2** The tour A B C D E A has length 109. Use it with your answers above to bracket the optimal tour, and comment on the nearest neighbour result. [4]

- B3** Explain why deleting a different node can give a better lower bound, and what you should do about it. [3]

SECTION C · Stretch

- C1** Deleting node P from a network leaves a minimum spanning tree of weight 48, and the two shortest edges from P are 9 and 11. A tour of length 71 has been found. What can be concluded? [4]