



QUESTION WORKBOOK

Maximum flow and the labelling procedure

Decision Mathematics 2 · Year FM

6 questions · 21 marks

PRINT EDITION

SECTION A · Warm-up

- A1** Explain what the two numbers written on each arc during the labelling procedure represent. [2]

- A2** A flow-augmenting path has spare capacities 9, 4 and 6 along it. State the extra flow it carries and what happens to one of its arcs. [2]

SECTION B · Standard

- B1** A network has SA 12, SB 9, AC 7, AD 6, BD 8, CT 10, DT 11. Starting from zero flow, find the maximum flow, listing each flow-augmenting path with the flow it carries. [6]

B2 Prove that your flow of 18 is maximal, naming the theorem you use. [4]

B3 A student argues that once every route from source to sink contains a saturated arc, the flow must be maximal. Explain the error. [3]

SECTION C · Stretch

C1 For the same network, at least 4 units must travel along BD. Explain what changes and whether the maximum flow of 18 can still be achieved. [4]