



QUESTION WORKBOOK

Allocation and the Hungarian algorithm

Decision Mathematics 2 · Year FM

6 questions · 23 marks

PRINT EDITION

SECTION A · Warm-up

- A1** Explain why subtracting the smallest entry of a row from every entry in that row cannot change which allocation is cheapest. [3]

- A2** A 5 by 5 reduced matrix needs only 4 lines to cover its zeros. State the next step. [2]

SECTION B · Standard

- B1** Workers P, Q, R are to be given jobs 1, 2, 3 at costs P 14, 9, 12; Q 11, 8, 15; R 13, 10, 9. Find the least cost allocation. [5]

- B2** Now treat the same table as profits and find the allocation of greatest total profit. [4]

- B3** A firm has 4 workers and only 3 jobs, and one worker refuses job 2. Describe the two adjustments needed before the algorithm is applied. [3]

SECTION C · Stretch

- C1** Costs are P 6, 11, 11; Q 9, 17, 13; R 12, 7, 5. Reduce the matrix, show that the line test fails, augment, and give the allocation and its cost. [6]