Module 7 · Transportation P16 · 7.0

SM pp. 470–499 (exercise 500–508). **A 7-mark VAM half in J25 and J26** (both June); D23 MCQ. Module 7 per paper: **J26-7 · D25-0 · J25-7 · D24-0 · J24-0 · D23-2**. Lower chance in December.

0 · Balance
supply ≠ demand → dummy row / column with zero cost

↓

1 · Penalties
each row and column: second-lowest − lowest cost

↓

2 · Allocate
highest penalty → its cheapest cell → as much as possible; tie: least cost, then larger allocation

↓

3 · Repeat, then cost
m + n − 1 cells; total = Σ cost × units; optimum test by MODI if asked

WORKED PATTERN · SM ILLUSTRATION 3 (VAM)

3 plants, 4 shops: P1R1 20, P1R3 30, P2R2 20, P2R4 35, P2R3 20, P3R4 25 → **₹650 thousand**, ₹20 thousand better than NWCM and ₹5 thousand better than LCM. [SM 482]

MODI: $u_i + v_j$ = cost for allocated cells; for empty cells cost − (u + v) < 0 → improve. Most negative cell enters (D23 MCQ: it lowers cost fastest). [SM 482]

OUR WORKINGS (VAM RECOMPUTED BY SCRIPT m06m07m09_patterns.py; OPTIMUM CHECKED BY LP)

JUN'25 Q6(a) CNG, ₹ '000

VAM: X→B 450, X→D 250, Y→C 350, Y→D 50, Z→A 400, Z→D 200 (6 cells) → **₹7,350 thousand** — this is also the optimum (an LP check finds no cheaper plan).

JUN'26 Q6(b) TRUCKS (UNBALANCED)

Supply 25 v demand 23 → dummy customer of 2 (cost 0). VAM: A→X 5, B→W 5, B→X 3, B→Y 2, C→Y 5, C→dummy 2, D→Y 3 (7 cells) → **₹98** (the first-step tie between B and C gives the same total). Not asked: MODI reaches ₹90 (B→dummy 2, C→Y 7).

Practise: J26 Q6(b), J25 Q6(a), MQP Q1(vi), postal Q7(ii) · SM Illus. 1–8 (SM 473–499) · **ICMAI Practice Workbook Ch5 illus. 1–10** · MCQ bank Q77–Q81, Q83, Q84, Q232.