Module 9 · Game theory P16 · 9.0

SM pp. 550–563 (exercise 564–570). **MCQ (vii) "value of the game" in most papers**; a 7-mark dominance game in D24 and J26. Module 9 per paper: **J26-7 · D25-2 · J25-2 · D24-7 · J24-2 · D23-2** (J23-8).

1 · Saddle point?
max of row minimums = min of column maximums → pure strategies, value

↓

2 · Dominance
drop a row ≤ another row (maximiser); drop a column ≥ another column (minimiser); averages of two may dominate

↓

3 · 2 × 2 by odds
$P(A_1) = |b_1 - b_2| \div (|b_1 - b_2| + |a_1 - a_2|)$; value = $(a_{11}a_{22} - a_{12}a_{21}) \div (a_{11} + a_{22} - a_{12} - a_{21})$

WORKED PATTERNS · SM ILLUSTRATIONS 1 AND 4

- Illus. 1 [1 5; 4 2]: no saddle (maximin 2, minimax 4); A plays 1/3, 2/3; B 1/2, 1/2; **value 3**. [SM 555–556]
- Illus. 4 (two toy makers, = J26 type): M_4 dominated by M_1, J_1 by J_3, M_1 by the average of M_2 and M_3 → saddle at J_3M_2, **value 12**. [SM 560–561]

OUR WORKINGS (RECOMPUTED BY SCRIPT m06m07m09_patterns.py)

JUN'26 Q7(a) MARKET SHARE, 4 × 4

A2 ≤ A1 → drop A2; for B, B1 and B2 ≥ B3 → drop both; then A3 ≤ A4 → drop A3. Left [A1: 25, 5; A4: 10, 15] — no saddle (10 v 15). A plays **A1 20%, A4 80%**; B plays **B3 40%, B4 60%**; **value 13** (A gains 13% share).

DEC'24 Q8(a) ADVERTISING, 3 × 3

No saddle (maximin 12, minimax 14). "No advertising" row ≤ "Medium" → drop; Q's "No advertising" column ≥ "Medium" → drop. Left [Medium: 12, 15; Heavy: 14, 10]: P plays Medium 4/7, Heavy 3/7; Q plays Medium 5/7, Heavy 2/7; **value 90/7 = 12.86**.

MCQs: 2 × 2 value (D23); saddle-point value of a 3 × 3 / 3 × 4 (J24, J25, D25 — check the saddle first). **Practise**: J26 Q7(a), D24 Q8(a), J23 Q9(a) · PTP Q7(a), postal Q8(b), MQP / PTP Q1(vii) · SM Illus. 1–5 (SM 555–563) · MCQ bank Q108–Q115, Q242, Q251.