

LC 2015 (SET B): PAPER 2

QUESTION 1 (25 MARKS)

Question 1 (a)

W = Win, L = Loss

| | | Die 2 | | | | | |
|-------|---|---------|---------|---------|----------|----------|----------|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Die 1 | 1 | [2] = L | [3] = L | [4] = L | [5] = L | [6] = L | [7] = L |
| | 2 | [3] = L | [4] = L | [5] = L | [6] = L | [7] = L | [8] = L |
| | 3 | [4] = L | [5] = L | [6] = L | [7] = L | [8] = L | [9] = W |
| | 4 | [5] = L | [6] = L | [7] = L | [8] = L | [9] = W | [10] = W |
| | 5 | [6] = L | [7] = L | [8] = L | [9] = W | [10] = W | [11] = W |
| | 6 | [7] = L | [8] = L | [9] = W | [10] = W | [11] = W | [12] = W |

MARKING SCHEME NOTES

Question 1 (a) [Scale 10C (0, 4, 8, 10)]

- 4:**
- At least one other correct entry
 - Partially correct table with at least 5 correct totals or couples
- 8:**
- Five or more correct entries including at least one other loss and one other win
 - Table correctly completed with totals or couples but no indication of W or L

Question 1 (b)

$$P(\text{Event}) = \frac{\text{Number of desired outcomes}}{\text{Number of possible outcomes}}$$

$$(i) P(W) = \frac{\text{Number of wins}}{\text{Number of possible outcomes}} = \frac{10}{36} = \frac{5}{18}$$

$$(ii) P(L) = \frac{\text{Number of losses}}{\text{Number of possible outcomes}} = \frac{26}{36} = \frac{13}{18}$$

$$P(\text{L and then L and then L}) = \frac{13}{18} \times \frac{13}{18} \times \frac{13}{18} = 0.3767$$

MARKING SCHEME NOTES

Question 1 (b) [Scale 10C (0, 4, 8, 10)]

- 4:**
- Favourable outcomes identified
 - (i) correct only $(\frac{10}{36}, \frac{5}{18}, 0.27, 0.28, 0.3)$
- 8:**
- (i) omitted or of no merit but (ii) $(\frac{13}{18})^3$

Question 1 (c)

This is a possible outcome: L W L L L W L L L W

The last W *has* to happen. The other 9 letters can be in any order.

$$P(3W's \text{ with a } W \text{ on tenth throw}) = {}^9C_2 \left(\frac{5}{18}\right)^2 \left(\frac{13}{18}\right)^7 \times \left(\frac{5}{18}\right) = 0.0791$$

MARKING SCHEME NOTES**Question 1 (c) [Scale 5C (0, 2, 4, 5)]**

- 2: • Relevant binomial formula with some substitution
• Identifies p^7 or $(1-p)^3$ or $(1-p)^2$ or $1-p$
• Listing at least any two of the ten throws
- 4: • Probability of two wins in nine throws