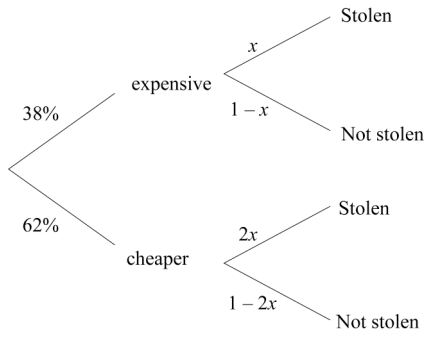# Assessment Schedule – 2007

## Statistics and Modelling: Solve straightforward problems involving probability (90643)

### Evidence Statement

| | Achievement Criteria | No. | Evidence | Code | Judgement | Sufficiency |
|---|---|---|---|---|---|---|
| **ACHIEVEMENT** | Solve straightforward problems involving probability. | 1 | E[Discount] $= \left(500 \times \frac{24}{36} + 1000 \times \frac{10}{36} + 5000 \times \frac{2}{36}\right) \times 15$ $= \$13\,333.33$ | A | Accept any suitable rounding. Accept CAO | *Achievement:* TWO of Code A |
| | | 2 | P(4-door with manual transmission) $= \frac{3}{30}$  $(= \frac{1}{10}$ or 0.1) | A | Some working needed Or equivalent | |
| | | 3(a) | P(loan for at least one car) $= 1 - (0.37 \times 0.52)$ $= 0.8076$ | A | Accept any suitable rounding. Accept CAO | |
| **MERIT** | Solve probability problems. | 3(b) | P(no loan for 1st car / loan for 2nd car) $= \frac{0.37 \times 0.48}{0.63 \times 0.91 + 0.37 \times 0.48}$ $= 0.2365$ | MA | Some working needed Accept any suitable rounding. Accept sequential error from 3(a). | *Merit:* Achievement **plus** TWO of Code M **Or** THREE of Code M |
| | | 4 | P(at least 5 sports cars) $= \frac{{}^{6}C_5 \times {}^{24}C_{15} \ + \ {}^{6}C_6 \times {}^{24}C_{14}}{{}^{30}C_{20}}$ $= 0.3264$ | MA | Accept any rounding to at least 2 sig. fig. Or equivalent. | |
| | | 5 | $P(A) = 0.4918$      $P(B) = 0.38$ so $P(A) \times P(B) = 0.186884$ | A | | |
| | | | $P(A \cap B) = 0.095$ $P(A \cap B) \neq P(A).P(B)$ Therefore $A$ and $B$ are not independent. | M | Must have both decision and suitable working to justify the decision. | |

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| | | 6 | Eg. | | | *Excellence:* |
|---|---|---|---|---|---|---|
| **EXCELLENCE** | Apply probability theory. | | <br><br>$P(\text{expensive car}|\text{not stolen}) = \dfrac{4}{9}$<br><br>$\dfrac{4}{9} = \dfrac{0.38 \times (1-x)}{0.38(1-x) + 0.62(1-2x)}$<br><br>$x = 0.1895$<br><br>$P(\text{expensive car} \cap \text{stolen})$<br><br>$= 0.38 \times 0.1895$<br><br>$= 0.072$ | A, M<br><br><br>E | Accept any rounding more than 2 sig. fig.<br><br>Must show how solution was arrived at. | Merit<br><br>**plus**<br><br>Code E |

## Judgement Statement — 2007

| Achievement | Achievement with Merit | Achievement with Excellence |
|---|---|---|
| Solve straightforward problems involving probability.<br><br><br>$2 \times A$ | Solve probability problems.<br><br><br>**Achievement** *plus*<br>$2 \times M$<br>*or*<br>$3 \times M$ | Apply probability theory.<br><br><br>**Merit** *plus*<br>$1 \times E$ |

The following Mathematics specific marking conventions may also have been used when marking this paper:

- Errors are circled.
- Omissions are indicated by a caret ($\wedge$).
- **NS** may have been used when there was not sufficient evidence to award a grade.
- **CON** may have been used to indicate 'consistency' where an answer is obtained using a prior, but incorrect answer and **NC** if the answer is not consistent with wrong working.
- **CAO** is used when the 'correct answer only' is given and the assessment schedule indicates that more evidence was required.
- **#** may be used when a correct answer is obtained but then further (unnecessary) working results in an incorrect final answer being offered.
- **RAWW** indicates right answer, wrong working.
- **R** for 'rounding error' and **PR** for 'premature rounding' resulting in a significant round-off error in the answer (if the question required evidence for rounding).
- **U** for incorrect or omitted units (if the question required evidence for units).
- **MEI** may have been used to indicate where a minor error has been made and ignored.