

|    |     |      |                                                                                                                                    |                                                   |                                         |                                                                                                                                                                            |
|----|-----|------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13 | (a) | (i)  | $P(\text{AA or BAA}) = 0.4^2 + 0.6 \times 0.4^2$ oe<br>$= 0.256$ or $\frac{32}{125}$                                               | <b>M1</b><br><b>A1</b><br><b>[2]</b>              | <b>3.1b</b><br><b>1.1</b>               | allow M1 for either $0.4^2 (\times \dots)$ or $0.6 \times 0.4^2 (\times \dots)$                                                                                            |
| 13 | (a) | (ii) | ABA or BAB<br>$P(\text{ABA or BAB}) = 0.4^2 \times 0.6 + 0.6^2 \times 0.4$<br>0.24                                                 | <b>M1</b><br><b>M1</b><br><b>A1</b>               | <b>3.1b</b><br><b>1.1</b><br><b>1.1</b> | both seen or implied<br>M1 for either $0.4^2 \times 0.6$ or $0.6^2 \times 0.4$                                                                                             |
|    |     |      | <b>Alternative method</b><br>$1 - ("0.256" + 0.6^2 + 0.4 \times 0.6^2)$<br>$= 0.24$                                                | <b>M1</b><br><b>M1</b><br><b>A1</b><br><b>[3]</b> |                                         | M1 for $1 - P(\text{A wins or B wins})$ attempted<br>M1 for $1 - ("0.256" (+ \dots))$ or $1 - ((\dots) + 0.6^2 + 0.4 \times 0.6^2)$<br>NB $0.4 \times 0.6 = 0.24$ : M0M0A0 |
| 13 | (b) |      | $'0.256' + '0.24' \times '0.256' + '0.24^2' \times 0.256 + \dots$<br>$= \frac{0.256}{1-0.24}$<br>$= \frac{32}{95}$ or 0.337 (3 sf) | <b>M1</b><br><b>M1</b><br><b>A1</b><br><b>[3]</b> | <b>3.1b</b><br><b>2.1</b><br><b>1.1</b> | ft (a)(i)&(ii)<br>ft (a)(i)&(ii) ie $\frac{(a)(i)}{1-(a)(ii)}$<br>cao $S_5 = 0.337$ SC B1, but with added comment M1M1A1                                                   |