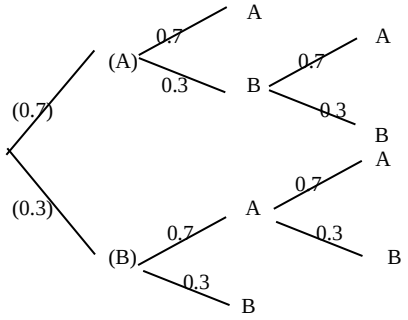
| | | | | | |
|---|---|---|---|---|---|
| **12** | **(a)** | | 0 | **B1**<br>**[1]** | Allow 0% |
| **12** | **(b)** | |  | **B1**<br>**B1**<br>**B1**<br>**[3]** | Ignore extra branches if no probabilities or $p = 0$<br>B2: 8 correct branches and probs <u>OR</u> names, no extra branches<br>B2: 7 correct branches, probs and names, no extra branches<br>B1: 8 correct branches without probs & names. No extra branches<br>B1: 6 correct branches, probs and names. Ignore extra branches<br>Ignore products at ends |
| **12** | **(c)** | | $0.3\times0.3 + 0.7\times0.3\times0.3 + 0.3\times0.7\times0.3$<br>**or** $0.09 + 0.063 + 0.063$ oe<br>$= \frac{27}{125}$ or 0.216 | **M1**<br>**M1**<br>**A1**<br>**[3]** | All correct M2 ft their diagram<br>Two products correct M1 ft their diagram<br>SC Correct answer with no working: B2 |
| **12** | **(d)** | | $0.7 \times 0.3 + 0.3 \times 0.7$ or $0.21 + 0.21$<br>$= \frac{21}{50}$ or 0.42 | **M1**<br>**A1**<br>**[2]** | or $1 - (0.7^2 + 0.3^2)$ or $1 - (0.49 + 0.09)$ Condone missing brackets<br>or $0.7\times0.3\times0.7 + 0.7\times0.3\times0.3 + 0.3\times0.7\times0.7 + 0.3\times0.7\times0.3$ oe<br>or $2 \times 0.147 + 2\times 0.063$ oe Wholly correct method ft their diagram<br>SC Correct answer with no working: B1 |
| **12** | **(e)** | | P(B wins and 3 points)<br>$= 0.7\times0.3\times0.3 + 0.3\times0.7\times0.3$ or $2 \times 0.063$<br>(= 0.126 oe)<br>$\frac{\text{P(B wins \& 3 points)}}{\text{P(B wins)}} = \frac{'0.126'}{'0.216'}$ | **M2**<br>**M1** | ft their diagram for M-marks<br>soi M1 for one correct product or 0.063<br>Must attempt $\frac{\text{P(B wins \& 3 points)}}{\text{Their (c) NOT (d) or } 0.3\times0.3+0.7\times0.3\times0.3+0.3\times0.7\times0.3}$ |

| Question | Answer | Mark | Guidance |
|---|---|---|---|
| | $= \frac{7}{12}$ | **A1**<br><br><br>**[4]** | Allow 0.583 (3 sf) SC no working $\frac{7}{12}$ B2<br>But minimal working is OK, eg $\frac{2\times0.063}{0.216} = \frac{7}{12}$ M2M1A1 |