11 a $A \cup B$ b $B' \cup A$ c $B \cap C \cap A'$

10 Unit test

1 a $1 - (0.15 + 0.25 + 0.20 + 0.16)$ or $1 - 0.76$ **[1]** $= 0.24$ **[1]** b 300×0.25 **[1]** $= 75$ **[1]**

2 a 3×5 **[1]** $= 15$ **[1]** b $\frac{1}{15}$ **[2]** [**1** for numerator, **1** for denominator]

3 Matches: BE, BS, BA, BF, ES, EA, EF, SA, SF, AF listed or 10 seen **[1]**
European v. South American: BE, BS, BF, EA, SA, AF or 6 (or 4) seen **[1]**
P(European v. South American) $= \frac{3}{5}$ or 0.6 or 60% **[1]**

4 P(B) $= 0.8 - 0.35 = 0.45$ **[1]**, P(not B) $= 1 - 0.45 = 0.55$ **[1]**

5 a Dependent **[1]** b Independent **[1]** c Dependent **[1]** d Independent **[1]**

6 a $\frac{4}{5} \times \frac{4}{5} \times \frac{4}{5}$ **[1]** $= \frac{64}{125}$ o.e. **[1]**

b $\left(\frac{4}{5} \times \frac{4}{5} \times \frac{4}{5}\right) + \left(\frac{1}{5} \times \frac{4}{5} \times \frac{4}{5}\right) + \left(\frac{4}{5} \times \frac{1}{5} \times \frac{4}{5}\right) + \left(\frac{4}{5} \times \frac{4}{5} \times \frac{1}{5}\right) + \left(\frac{4}{5} \times \frac{1}{5} \times \frac{1}{5}\right) + \left(\frac{1}{5} \times \frac{4}{5} \times \frac{1}{5}\right) + \left(\frac{1}{5} \times \frac{1}{5} \times \frac{4}{5}\right)$ **[2]**
[**1** for at least one correct product or correct evaluation of incorrect products] $= \frac{124}{125}$ **[1]**
OR $1 - \left(\frac{1}{5} \times \frac{1}{5} \times \frac{1}{5}\right)$ **[2]** [**1** for $\frac{1}{5} \times \frac{1}{5} \times \frac{1}{5}$ or 1 – P(no seeds germinate) seen] $= \frac{124}{125}$ **[1]**

7 $\left(\frac{3}{11} \times \frac{2}{10}\right) + \left(\frac{3}{11} \times \frac{8}{10}\right) + \left(\frac{8}{11} \times \frac{3}{10}\right) = \frac{6+24+24}{110}$ **[3]**
[**2** for at least one correct product or correct evaluation of incorrect products] $= \frac{54}{110}$ or $\frac{27}{55}$ **[1]**
OR $1 - \left(\frac{8}{11} \times \frac{7}{10}\right)$ **[3]** [**2** for $\frac{8}{11} \times \frac{7}{10}$ or 1 – P(jam, jam) seen] $= \frac{54}{110}$ or $\frac{27}{55}$ **[1]**
[Allow **1** for correct working leading to $\frac{57}{121}$ (with replacement)]

8 a P(B) $= \frac{28}{38}$ or $\frac{14}{19}$ **[1]** b P(S′) $= \frac{18}{38}$ or $\frac{9}{19}$ **[1]**

c P(B ∩ S) $= \frac{13}{38}$ **[1]** d P(B ∪ S) $= \frac{35}{38}$ **[1]**

9 a 12 **[1]**

b i P(B ∩ E) $= \frac{35}{70}$ or $\frac{1}{2}$ **[1]**

ii P(S ∩ B ∩ E) $= \frac{12}{70}$ or $\frac{6}{35}$ **[2]** [**1** for numerator, **1** for denominator]

iii P(S ∩ E | S) $= \frac{27}{38}$ **[2]** [**1** for numerator, **1** for denominator]

10 $\frac{15}{27} \times \frac{14}{26}$ **[3]** [**1** for $\frac{15}{27}$ or $\frac{5}{9}$ seen; in second fraction, **1** for numerator, **1** for denominator] $= \frac{35}{117}$ **[1]**

Sample student answer

a Labels to show the flavour each branch represents are missing from the tree diagram.

b Labels to show the combination that each calculation represents are missing.

c There should be a sentence to clearly state the answer to the question.