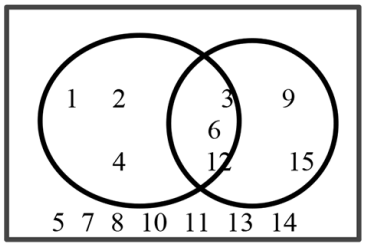
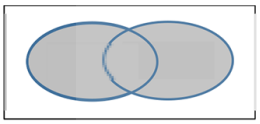
01. 0607_m24_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)		**2**	**B1** for 1 or 2 elements misplaced or omitted.
(a)(ii)	3, 6, 12	**1**	**FT** *their* Venn diagram
(a)(iii)	5	**1**	**FT** *their* Venn diagram
(b)(i)	$\frac{4}{7}$		
(b)(ii)	$\frac{2}{5}$ oe	**2**	**M1** for $\frac{4}{6}\times\frac{3}{5}$ oe
(b)(iii)	$\frac{23}{42}$ oe	**3**	**M2** for $\frac{1}{2}\times\frac{3}{7}+\frac{1}{2}\times\frac{4}{6}$ or **M1** for one of above products

Question	Answer	Marks	Partial Marks
(a)(i)	0	1	
(a)(ii)	$\frac{3}{5}$ oe	1	
(a)(iii)	$\frac{6}{25}$ oe	3	**M2** for $\left(\frac{1}{5}\times\frac{1}{5}\right)+\left(\frac{2}{5}\times\frac{1}{5}\right)+\left(\frac{1}{5}\times\frac{1}{5}\right)+\left(\frac{1}{5}\times\frac{2}{5}\right)$ or correct sample space showing all 6 points or **M1** for 2 correct products or correct sample space showing at least 3 points or list of all correct pairs If 0 scored, **SC1** for $\frac{12}{25}$

Question	Answer	Marks	Partial Marks
(a)(iv)	$\frac{6}{25}$	3	**M2** for $\left(\frac{2}{5}\times\frac{2}{5}\right)+\left(\frac{1}{5}\times\frac{1}{5}\right)+\left(\frac{1}{5}\times\frac{1}{5}\right)$ or correct sample space showing all 6 points or **M1** for 2 correct products or correct sample space showing at least 3 or for listing pairs that sum to 6
(b)(i)		1	
(b)(ii)	$A \cap B'$	1	
(b)(iii)	8	1	

03. 0607_s24_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
	For all parts accept decimals or percentages with the usual rules for 3sf Do not penalise incorrect cancelling or converting Do not accept ratios or words		
(a)(i)	$\frac{5}{12}$	**1**	
(a)(ii)	25	**1**	**FT** 60 × *their*(**a**)(**i**) but must be an integer
(b)(i)	$\frac{1}{11}$ oe	**2**	**M1** for $\frac{4}{12}\times\frac{3}{11}$
(b)(ii)	$\frac{10}{33}$ oe	**3**	**M2** for $\frac{5}{12}\times\frac{4}{11}\times 2$ oe or **M1** for $\frac{5}{12}\times\frac{4}{11}$ oe If 0 scored, **SC1** for $\frac{5}{18}$ oe
(c)	$\frac{25}{72}$ oe	**3**	**M2** for $\frac{5}{12}\times\frac{5}{12}+\frac{4}{12}\times\frac{4}{12}+\frac{3}{12}\times\frac{3}{12}$ oe or **M1** for two of these products If 0 scored, **SC1** for $\frac{19}{66}$ oe

04. 0607_s24_ms_43 Q: 3

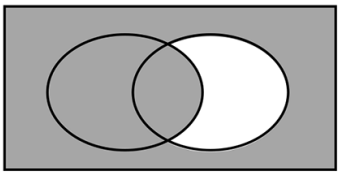
Question	Answer	Marks	Partial Marks
	For all parts accept decimals or percentages with the usual rules for 3sf. Do not penalise incorrect cancelling or converting. Do not accept ratios or words		
(a)(i)	$\frac{2}{3}$ oe	1	
(a)(ii)	$\frac{1}{2}$ oe	1	
(b)(i)	$\frac{1}{36}$ oe	2	**M1** for $\frac{1}{6}\times\frac{1}{6}$
(b)(ii)	$\frac{35}{36}$ oe	1	**FT** 1 – *their* **(b)(i)**
(c)(i)	0.52 oe 0.72 oe 0.16 oe Correctly placed	2	**B1** for one correctly placed
(c)(ii)	0.4368 oe	2	**M1** for *their* 0.52 × 0.84 oe

05. 0607_m23_ms_42 Q: 12

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{x^2}{(x+y+z)^2}$ oe final answer	2	**M1** for $\frac{x}{(x+y+z)}$
(a)(ii)	$\frac{2yz}{(x+y+z)^2}$ oe final answer	2	**M1** for $\frac{y}{x+y+z}\times\frac{z}{x+y+z}$

Question	Answer	Marks	Partial Marks
(b)	$\frac{7}{13}$	3	**M2** for $\frac{x}{x+y}=\frac{7}{20}$ oe soi or **M1** for $\frac{x^2}{(x+y)^2}=\frac{49}{400}$

06. 0607_s23_ms_41 Q: 10

Question	Answer	Marks	Partial Marks
(a)(i)		1	
(a)(ii)	$(A \cup B) \cap C'$ oe	1	
(b)(i)	10	1	
(b)(ii)	18	1	
(b)(iii)	$\frac{8}{20}$ oe	1	
(b)(iv)	$\frac{33}{95}$ oe	2	**M1** for $\frac{n}{20} \times \frac{n-1}{19}$, $n < 20$
(b)(v)(a)	$\frac{4}{13}$	2	**M1** for $\frac{n}{14} \times \frac{n-1}{13}$, $n < 14$
(b)(v)(b)	$\frac{48}{91}$	3	**M2** for $\frac{6}{14} \times \frac{8}{13} + \frac{8}{14} \times \frac{6}{13}$ oe or **M1** for $[2 \times]\frac{n}{14} \times \frac{14-n}{13}$ oe $n < 14$

07. 0607_s23_ms_42 Q: 4

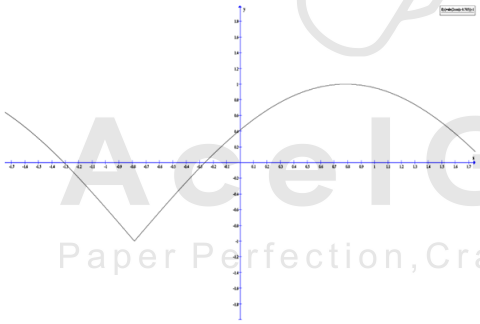
Question	Answer	Marks	Partial Marks
(a)	Correct cumulative frequency curve	4	**B2** for 5 or 6 correct heights or **B1** for 6, 24, 90, 130, 148, 160 soi **B1** for points plotted at right hand end of interval.
(b)(i)	66 to 69	1	**FT** *their* curve
(b)(ii)	10 to 15	2	**B1** for [lq] = 62 to 64 or [uq] = 74 to 77 **FT** *their* curve for **B1**
(c)	61 to 63 nfww	3	**B2** for 34 soi or **M1** for 160 × 0.6 oe soi by 96

08. 0607_s23_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$\frac{1}{10}$ oe	1	
(b)	$\frac{2}{15}$ oe	2	**M1** for $\frac{4}{10}\times\frac{3}{9}$

Question	Answer	Marks	Partial Marks
(c)	$\frac{1}{40}$ oe	3	**M2** for $k\times\frac{1}{10}\times\frac{3}{9}\times\frac{1}{8}$ oe, $k = 3$, 4, 5 or 6 or **M1** for $\frac{1}{10}\times\frac{3}{9}\times\frac{1}{8}$ oe If 0 scored **SC1** for indicating 6 possibilities
(d)	5	3	**M2** for $\left(\frac{4}{10}\right)^{n-1}\times\left(\frac{6}{10}\right)=\frac{48}{3125}$ oe or **M1** for $\left(\frac{4}{10}\right)^{k}\times\left(\frac{6}{10}\right)$, $k \geqslant 2$ oe

09. 0607_s23_ms_43 Q: 7

Question	Answer	Marks	Partial Marks
(a)		3	Correct graph **B1** for 1 max in first quadrant **B1** for V shape at approx $x = -45$

Question	Answer	Marks	Partial Marks
(b)	–75, –15	**2**	**B1** for each
(c)	(45, 1)	**1**	
(d)(i)	–64.8 or –64.76... –17.9 or – 17.92... 88.8 or 88.78....	**3**	**B1** for each or for –65, –18, 89 If 0 scored **SC1** for sketch of $y = 0.005x$
(d)(ii)	$x < -64.8$ $-17.9 < x < 88.8$	**2**	**FT** **B1** for one correct

10. 0607_s23_ms_43 Q: 9

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{5}{80}$ oe	**1**	
(a)(ii)	$\frac{28}{80}$ oe	**1**	
(b)	$\frac{17}{36}$ oe	**2**	**M1** for $\frac{k}{36}$ where $k < 36$ or $\frac{17}{m}$ where $17 < m < 80$
(c)(i)	$\left[\frac{12}{44}\times\frac{16}{43}\times\frac{8}{42}\times 6\right] = \frac{384}{3311}$ oe	**1**	

Question	Answer	Marks	Partial Marks
(c)(ii)	$\frac{3648}{9933}$ or $\frac{1216}{3311}$ oe or 0.367 or 0.3672 to 0.3673	**3**	**M2** for $\left(\frac{12}{44}\times\frac{16}{43}\times\frac{8}{42} + \frac{12}{44}\times\frac{16}{43}\times\frac{8}{42} + \frac{12}{44}\times\frac{8}{43}\times\frac{8}{42} + \frac{16}{44}\times\frac{8}{43}\times\frac{8}{42}\right)\left[\times k < 6\right]$ or **M1** for any two of these products seen

11. 0607_w23_ms_41 Q: 9

Question	Answer	Marks	Partial Marks
(a)	45	1	
(b)	$\frac{1}{6}$ and $\frac{1}{5}$ correctly placed $\frac{2}{5}$ and $\frac{3}{5}$ correctly placed	2	**B1** **B1**
(c)	$\frac{11}{5}$ oe	3	**M2** for $\frac{5}{6}\times\frac{4}{5}+their\frac{1}{6}\times their\frac{2}{5}$ or **M1** for $\frac{5}{6}\times\frac{4}{5}$ or $their\frac{1}{6}\times their\frac{2}{5}$

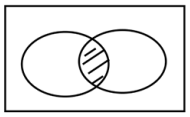
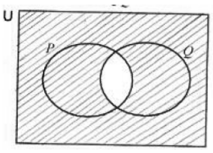
Question	Answer	Marks	Partial Marks
(d)	$\frac{25}{7776}$ oe	3	**M2** for $\left(\frac{5}{6}\right)\left(their\frac{1}{6}\right)^4$ [×5] oe or **M1** for $\left(\frac{5}{6}\right)\left(their\frac{1}{6}\right)^k$, $k>1$

12. 0607_w23_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{3}{8},\frac{5}{8},\frac{2}{7},\frac{5}{7},\frac{3}{8},\frac{5}{8}$	3	**B1** for each correct pair in correct position
(a)(ii)	$\frac{365}{1568}$ or 0.233	4	**FT** *their* tree diagram probabilities for method marks **M3** for $\frac{3}{8}\times\frac{2}{7}\times\frac{5}{6}$[+] $\frac{3}{8}\times\frac{5}{7}\times\frac{2}{7}$ [+] $\frac{5}{8}\times\frac{3}{8}\times\frac{2}{7}$ soi without extras or **M2** for two correct products soi or **M1** for one correct product soi or for clear indication on tree diagram of all three combinations. or list of the options
(b)(i)	$10-x$	1	
(b)(ii)(a)	$\frac{x}{10+y}=\frac{1}{3}$ oe seen leading to $3x=10+y$	1	

Question	Answer	Marks	Partial Marks
(b)(ii)(b)	[x = or red =] 6 [y = or blue =] 8	**5**	**B2** for $9x+2y=70$ oe or **B1** for $\frac{10-x}{10+y}=\frac{2}{9}$ **M1** for correct method to eliminate one variable **A1** for [x = or red =] 6 or [y = or blue =] 8

13. 0607_w23_ms_43 Q: 9

Question	Answer	Marks	Partial Marks
(a)	U  B 	**2**	**B1** for each
(b)(i)	21	**1**	
(b)(ii)	$\frac{13}{120}$ oe	**1**	
(b)(iii)	$\frac{35}{528}$ oe	**3**	**M2** for $\frac{5}{33}\times\frac{7}{32}+\frac{7}{33}\times\frac{5}{32}$ oe or **M1** for either product correct
(b)(iv)	$\frac{3}{1003}$ oe	**3**	**M2** for $k\times\frac{21}{120}\times\frac{20}{119}\times\frac{4}{118}$ oe $k=1$, 3 or 6 or **M1** for $\frac{p}{120}\times\frac{p-1}{119}\times\frac{4}{118}$ oe

14. 0607_s21_ms_41 Q: 8

Question	Answer	Marks	Partial Marks
(a)	$\frac{1}{3}$ oe	1	
(b)	0	1	
(c)	$\frac{1}{6}$ oe	2	**M1** for $\frac{1}{6}\times\frac{1}{4}+\frac{1}{6}\times\frac{1}{4}+\frac{1}{6}\times\frac{1}{4}+\frac{1}{6}\times\frac{1}{4}$ oe or for $\frac{k}{6\times4}$ where $k <$ *their* (6×4) or for table of outcomes with correct 4 identified
(d)	$\frac{5}{12}$ oe	3	**M2** for $\frac{4}{6}\times\frac{1}{4}+\frac{2}{6}\times\frac{3}{4}$ or **M1** for either of these products seen OR **M2** for table of outcomes with correct 10 identified or **M1** for table of outcomes with 8 or 9 correct identified
(e)	$\frac{1}{3}$ oe	2	**M1** for at least 6 of (2, 4) (3, 3) (4, 2) (4, 5) (5, 4) (6, 3) (7, 2) (7, 5) identified

15. 0607_s21_ms_43 Q: 10

Question	Answer	Marks	Partial Marks
(a)(i)	0.055 oe	3	**M2** for $0.9\times0.06+0.1\times0.01$ oe or **M1** for 0.9×0.06 oe or 0.1×0.01 oe
(a)(ii)	0.945 oe	1	**FT** 1 – *their* (a)(i)
(a)(iii)	189	1	**FT** $200 \times$ *their* (a)(ii)
(b)	0.15 oe	2	**M1** for $0.8 \times p = 0.12$ oe

16. 0607_w21_ms_43 Q: 13

Question	Answer	Marks	Partial Marks
	For all parts accept decimals or percentages with the usual rules for 3sf Do not penalise incorrect cancelling or converting Do not accept ratios or words		
(a)	$\frac{7}{10}$ oe	1	

Question	Answer	Marks	Partial Marks
(b)(i)	$\frac{12}{55}$ oe	2	**M1** for $\frac{3}{10}\times\frac{8}{11}$
(b)(ii)	$\frac{29}{55}$ oe	3	**M2** for $\frac{3}{10}\times\frac{3}{11}+\frac{7}{10}\times\frac{7}{11}$ or **M1** for either of these products seen
(b)(iii)	$\frac{26}{55}$ oe	3	**M2** for 1 – *their* **(b)(ii)** OR **M2** for $\frac{7}{10}\times\frac{4}{11}+\frac{3}{10}\times\frac{8}{11}$ or **M1** for either of these products seen

17. 0607_s20_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{12}{50}$ oe	1	
(a)(ii)	$\frac{16}{50}$ oe	1	
(a)(iii)	$\frac{7}{50}$ oe	1	
(b)	$\frac{42}{600}$ oe	2	**M1** for $\frac{7}{25}$ soi
(c)	$\frac{24}{42}$ oe	3	**M2** for $\left(\frac{4}{7}\times\frac{3}{6}\right)+\left(\frac{3}{7}\times\frac{4}{6}\right)$ or **M1** for $\frac{4}{7}\times\frac{3}{6}$ or $\frac{3}{7}\times\frac{4}{6}$
(d)	$\frac{792}{117600}$ or $\frac{33}{4900}$ oe	4	**M3** for $\left(\frac{2}{50}\times\frac{12}{49}\times\frac{11}{48}\right)+\left(\frac{12}{50}\times\frac{2}{49}\times\frac{11}{48}\right)$ $+\left(\frac{11}{50}\times\frac{12}{49}\times\frac{2}{48}\right)$ oe or **M2** for any two products or **M1** for any one of above products

18. 0607_w20_ms_41 Q: 11

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{7}{12}$ oe	1	
(a)(ii)	840	1	**FT** *their* **(i)**
(b)(i)	$\frac{1}{16}$ oe	2	**M1** for $\frac{3}{12}\times\frac{3}{12}$
(b)(ii)	$\frac{25}{72}$ oe	3	**M2** for $\frac{3}{12}\times\frac{3}{12}+\frac{4}{12}\times\frac{4}{12}+\frac{5}{12}\times\frac{5}{12}$ or **M1** for any one of these products seen
(b)(iii)	$\frac{47}{72}$ oe	1	**FT** 1 – *their* **(ii)** or $\frac{4}{12}\times\frac{8}{12}+\frac{5}{12}\times\frac{7}{12}+\frac{3}{12}\times\frac{9}{12}$
(c)(i)	$\frac{3}{44}$ oe	3	**M2** for $\frac{4}{12}\times\frac{5}{11}\times\frac{3}{10}$ or $\frac{3}{12}\times\frac{5}{11}\times\frac{2}{10}$ or **M1** for any product of three proper fractions with denominators 12, 11 and 10
(c)(ii)	$\frac{12}{55}$ oe	4	**M3** for $\frac{4}{12}\times\frac{3}{11}\times\frac{8}{10}\times3$ oe or **M2** for $\frac{4}{12}\times\frac{3}{11}\times\frac{8}{10}$ oe or **M1** for product of three fractions with numerators 4, 3, 8 oe

19. 0607_w20_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)	$\frac{5}{7}$ oe	1	
(b)(i)	$\frac{6}{35}$ oe	2	**M1** for $\frac{6}{10}$ seen
(b)(ii)	$\frac{33}{70}$ oe	3	**M2** for $\frac{5}{7}\times\frac{5}{10}\times\frac{2}{7}\times\frac{4}{10}$ or **M1** for one of above products
(c)	$\frac{1250}{16807}$	2	**M1** for $\frac{5}{7}\times\frac{5}{7}\times\frac{5}{7}\times\frac{5}{7}\times\frac{2}{7}$
(d)	4 nfww	3	**M2** for $\frac{4}{9}\times\frac{3}{8}\times\frac{2}{7}\times\frac{5}{6}$ or **M1** for a correct trial with black(s) then white

20. 0607_s19_ms_43 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{19}{120}$ oe	1	
(a)(ii)	$\frac{3}{4}$ oe	1	
(b)	$\frac{13}{60}$ oe	2	**M1** for $\frac{k}{16+19+12+13}$
(c)	$\frac{13}{145}$ or $\frac{2184}{24360}$ oe	3	**M2** for $\frac{14}{30}\times\frac{13}{29}\times\frac{12}{28}$ or **M1** for $14\times13\times12$ oe seen or $30\times29\times28$ oe seen

21. 0607_w19_ms_41 Q: 6

Question	Answer	Marks	Partial Marks
(a)	$\frac{1}{6}$ oe	1	
(b)(i)	$\frac{2}{12}$ oe	2	**M1** for $\frac{2}{6}\times\frac{1}{2}$ oe
(b)(ii)	$\frac{8}{12}$ oe	2	**M1** for $\frac{2}{6}+\frac{1}{2}-\frac{2}{6}\times\frac{1}{2}$ or indicating all 8 outcomes or $\frac{2}{6}\times\frac{1}{2}+\frac{4}{6}\times\frac{1}{2}+\frac{2}{6}\times\frac{1}{2}$ oe
(c)	$\frac{7}{8}$ oe	2	**M1** for $1-\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}$ oe
(d)	$\frac{36}{216}$ oe	3	**M2** for $\frac{3}{6}\times\frac{2}{6}\times\frac{1}{6}\times 6$ oe or **M1** for one product
(e)	6	1	
(f)	1, 2	2	**M1** for probability of 1 then 2 or 2 then 1 is $\frac{1}{2}\times\frac{1}{3}$ or $\frac{1}{3}\times\frac{1}{2}$ or for $2\times\frac{1}{2}\times\frac{1}{3}$ or $2\times\frac{1}{3}\times\frac{1}{2}$ seen or for clear list

22. 0607_w19_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)	0 cao	1	
(b)	$\frac{5}{6}$ oe	1	
6(c)	$\frac{4}{24}$ oe	2	**M1** for $\frac{1}{4}\times\frac{1}{6}$ or **B1** for $\frac{k}{24}$ soi k integer from 1 to 23
(d)	$\frac{12}{24}$ oe	3	**M2** for $\frac{2}{4}\times\frac{3}{6}+\frac{2}{4}\times\frac{3}{6}$ oe or for 12 pairs listed or indicated or **M1** for $\frac{2}{4}\times\frac{3}{6}$ oe or for 10 or 11 pairs listed or indicated
(e)	$\frac{4}{24}$ oe	2	**M1** for $\frac{1}{4}\times\frac{1}{6}$ or for (1, 5) (2, 4) (3, 3) (4, 2) listed or indicated

23. 0607_s18_ms_41 Q: 7

Question	Answer	Marks	Partial Marks
(a)	$\frac{6}{30}$ oe	2	**M1** for $\frac{3}{6}\times\frac{2}{5}$ oe
(b)	$\frac{12}{30}$ oe	3	**M2** for $\frac{2}{6}\times\frac{3}{5}\times 2$ oe or **M1** for $\frac{2}{6}\times\frac{3}{5}$ oe
(c)	$\frac{28}{30}$ oe	2	**M1** for $1-\frac{2}{6}\times\frac{1}{5}$ oe

24. 0607_w17_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{2}{6}$ oe	1	
(a)(ii)	$\frac{4}{6}$ oe	1	
(a)(iii)	$\frac{4}{6}$ oe	1	
(b)(i)	$\frac{1}{36}$ oe	2	**M1** for $\frac{1}{6}\times\frac{1}{6}$
(b)(ii)	$\frac{4}{36}$ oe	3	**M2** for $\frac{1}{6}\times\frac{2}{6}+\frac{2}{6}\times\frac{1}{6}$ oe or **M1** for one product soi by $\frac{1}{18}$ oe
(c)	$\frac{215}{216}$ oe	2	**M1** for $1-\frac{1}{6}\times\frac{1}{6}\times\frac{1}{6}$ oe

25. 0607_s16_ms_43 Q: 14

Question	Answer	Mark	Part Marks
(a) (i)	$\left(\frac{x}{x+y}\right)^2$ oe final answer	2	**B1** for $\frac{x}{x+y}$
(ii)	$2\times\frac{xy}{(x+y)^2}$ oe final answer	3	**M2** for $\frac{x}{(x+y)}\times\frac{y}{(x+y)}$ oe or **B1** for $\frac{y}{x+y}$ seen
(b) (i)	$\frac{x(x-1)}{(x+y)(x+y-1)}$ oe final answer	3	**B2** for $\frac{x-1}{x+y-1}$ or **B1** for $x+y-1$ seen
(ii)	$2\times\frac{xy}{(x+y)(x+y-1)}$ oe final answer	3	**M2** for $\frac{x}{(x+y)}\times\frac{y}{(x+y-1)}$ oe or **B1** for $\frac{y}{x+y-1}$ seen

26. 0607_w16_ms_43 Q: 11

Question	Answer	Mark	Part Marks
(a)	Walking / Cycling / Total Male: [16] / 13 / [29] Female: 12 / 9 / 21 Total: 28 / [22] / [50]	2	**B1** for 3 or 4 correct
(b)	$\frac{462}{2450}$ oe	2	**M1** for $\frac{22}{50}\times\frac{21}{49}$ oe
(c)	$\frac{384}{756}$ oe	3	**M2** for $\frac{16}{\textit{their}\ 28}\times\frac{\textit{their}\ 12}{\textit{their}\ 28-1}+\frac{\textit{their}\ 12}{\textit{their}\ 28}\times\frac{16}{\textit{their}\ 28-1}$ oe or **M1** for one of above products

27. 0607_s15_ms_42 Q: 9

Qu.	Answer	Mark	Part Marks
(a) (i)	$\frac{4}{10}, \frac{2}{10}, \frac{4}{10}$	1	
	$\frac{5}{11}, \frac{2}{11}, \frac{4}{11}$	1	
	$\frac{5}{10}, \frac{2}{10}, \frac{3}{10}$	1	
(b) (i)	$\frac{4}{121}$ oe	2	**M1** for $\frac{2}{11} \times their \frac{2}{11}$
(ii)	$\frac{32}{110}$ oe	3	**M2** for $\frac{5}{11} \times their \frac{4}{10} + \frac{4}{11} \times their \frac{3}{10}$ oe or **M1** for one of above products without incorrect extras
(iii)	$\frac{189}{605}$ oe	3	**M2** for $\frac{5}{11} \times their \frac{2}{10} + \frac{2}{11} \times their \frac{5}{11} + \frac{2}{11} \times their \frac{4}{11} + \frac{4}{11} \times their \frac{2}{10}$ oe or **M1** for 2 of above products or one of $\left(\frac{5}{11} + \frac{4}{11}\right) \times their \frac{2}{10}$, $\frac{2}{11} \times \left(their \frac{5}{11} + their \frac{4}{11}\right)$

28. 0607_w15_ms_41 Q: 9

Question	Answer	Mark	Part Marks
(a) (i)	$\frac{3}{36}$ oe	2	**M1** for $\frac{1}{6} \times \frac{3}{6}$ oe
(ii)	$\frac{5}{36}$ oe	3	**M2** for $\frac{1}{6} \times \frac{2}{6} + \frac{3}{6} \times \frac{1}{6}$ oe or **M1** for $\frac{1}{6} \times \frac{2}{6}$ or $\frac{3}{6} \times \frac{1}{6}$ oe or for list or space diagram showing at least 3 combinations
(b)	$\frac{128}{1296}$ oe	2	**M1** for $\frac{4}{6} \times \frac{4}{6} \times \frac{4}{6} \times \frac{2}{6}$ oe
(c)	6	2	**M1** for $\left(\frac{5}{6}\right)^k \times \frac{1}{6}$ or **SC1** for answer 5

29. 0607_w15_ms_42 Q: 10

Question	Answer	Mark	Part Marks
(a) (i)	$\frac{6}{336}$ oe	2	**M1** for $\frac{3}{8}\times\frac{2}{7}\times\frac{1}{6}$
(ii)	$\frac{90}{336}$ oe	3	**M2** for $3\times\frac{3}{8}\times\frac{2}{7}\times\frac{5}{6}$ or **M1** for $\frac{3}{8}\times\frac{2}{7}\times\frac{5}{6}$ If **M0** scored, then **B1** for RRB, RBR, BRR
(iii)	$\frac{270}{336}$ $\frac{45}{56}$ oe	3	**M2** for $3\times\frac{3}{8}\times\frac{5}{7}\times\frac{4}{6}$ + *their* **(a)(ii)** or for 1 – *their* **(a)(i)** $-\frac{5}{8}\times\frac{4}{7}\times\frac{3}{6}$ or **M1** for $\frac{5}{8}\times\frac{4}{7}\times\frac{3}{6}$ + *their* **(a)(i)** or for $\frac{3}{8}\times\frac{5}{7}\times\frac{4}{6}+\frac{3}{8}\times\frac{2}{7}\times\frac{5}{6}$
(b)	30	2FT	**M1** for $1680\times$ *their* **(a)(i)**

30. 0607_m22_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	$\frac{4}{5}$ oe $\frac{7}{10},\frac{3}{10}$ oe $\frac{9}{10},\frac{1}{10}$ oe	3	**B1** for each pair of branches
(b)(i)	$\frac{18}{25}$ oe	2	**M1** for *their* $\frac{4}{5}\times$ *their* $\frac{9}{10}$
(b)(ii)	$\frac{43}{50}$ oe	2	**M1** for *their* **(b)(i)** + $\frac{1}{5}\times$ *their* $\frac{7}{10}$ oe
(c)(i)	$\frac{36}{43}$ oe	2	**M1** for *their* **(b)(ii)** $\times p$ = *their* **(b)(i)** or better
(c)(ii)	*their* **(b)(ii)**, 1 – *their* **(b)(ii)** oe *their* **(c)(i)**, 1 – *their* **(c)(i)** oe $\frac{4}{7},\frac{3}{7}$ oe	3	**B1** for each pair of branches

31. 0607_s21_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	(0.7) 0.25 oe 0.05 oe	**B1**	
	0.2 oe 0.4 oe (0.55) 0.25 oe	**B1**	
(b)(i)	0.13 oe	**3**	**M2** for 0.6 × *their* 0.05 + *their* 0.4 × *their* 0.25 oe or **M1** for one of above products
(b)(ii)	0.63 oe	**3**	**M2** for *their* (b)(i) + 0.6 × 0.7 + *their* 0.4 × *their* 0.2 or **M1** for 0.6 × 0.7 + *their* 0.4 × *their* 0.2 OR **M2** for 0.6 × *their* 0.75 + *their* 0.4 × *their* 0.45 oe or **M1** for one of above products OR **M2** for 1 – 0.6 × *their* 0.25 – *their* 0.4 × 0.55 or **M1** for 0.6 × *their* 0.25 and *their* 0.4 × 0.55
(c)	0.36[0] or 0.3601 to 0.3602 oe	**3**	**M2** for $5 \times 0.7^4 \times 0.3$ oe or **M1** for $0.7^4 \times 0.3$ oe

32. 0607_w21_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	Correct tree diagram 0.6 oe 0.9 and 0.1 oe 0.95 and 0.05 oe	3	**B1** for each
(b)	0.93 oe	3	**M2** for $0.4 \times 0.9 + 0.6 \times 0.95$ or **M1** for 0.4×0.9 or 0.6×0.95
11(a)	502 or 502.1 to 502.3 nfww	7	**M2** for $8^2 + 5^2 - 2 \times 8 \times 5 \times \cos 100$ or **M1** for $\cos 100 = \frac{8^2 + 5^2 - BP^2}{2 \times 8 \times 5}$ **M1** for $[2 \times] \frac{1}{2} \times 8 \times 5 \times \sin 100$ **M1** for 20×8 **M1** for 20×5 **M1** for *their BP* $\times 20$

33. 0607_s19_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)	0.3 0.8 0.05 and 0.95	3	**B1** **B1** **B1**
(b)(i)	0.155 oe	3	**M2** for 0.7×0.2 + *their* $0.3 \times$ *their* 0.05 or **M1** for 0.7×0.2 or *their* $0.3 \times$ *their* 0.05
(b)(ii)	31	1	**FT** $200 \times$ *their* **(i)**

34. 0607_s18_ms_43 Q: 8

Question	Answer	Marks	Partial Marks
(a)	Fully correct tree diagram	3	**B1** for each column correct of 0.9 and 0.1 correctly placed (L &R) 0.8 and 0.2 correctly placed (S) 0.7 and 0.3 correctly placed (W)
(b)	0.504	2	**M1** for $0.9 \times 0.8 \times 0.7$
(c)	0.398	4	**M3** for $0.9 \times 0.8 \times 0.3 + 0.9 \times 0.2 \times 0.7 + 0.1 \times 0.8 \times 0.7$ or **M2** for 2 of above products or **M1** for 1 of above products

35. 0607_w18_ms_43 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$\frac{11}{20}$ oe	2	**M1** for $1-\frac{1}{5}-\frac{1}{4}$
(b)(i)	$\frac{2}{3}$ and $\frac{11}{20}$ correctly placed	1	**FT** *their* **(a)**
(b)(ii)	$\frac{8}{15}$ oe	3	**M2** for $\frac{2}{3}\times\left(\frac{1}{4}+\textit{their}\frac{11}{20}\right)$ or $\frac{2}{3}\times\left(1-\frac{1}{5}\right)$ oe or $1-\frac{1}{3}-\left(\frac{2}{3}\times\frac{1}{5}\right)$ or **M1** for $\frac{2}{3}\times\left(\frac{1}{4}\right)$ or $\frac{2}{3}\times\left(\textit{their}\frac{11}{20}\right)$ or $\frac{1}{3}+\left(\frac{2}{3}\times\frac{1}{5}\right)$ or $\frac{1}{4}+\frac{11}{20}$
(b)(iii)	48 final answer	1	**FT** *their* **(b)(ii)**

36. 0607_w17_ms_41 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$\frac{3}{8}, \frac{5}{8}$ correctly placed $\frac{2}{7}, \frac{5}{7}$ correctly placed $\frac{6}{9}, \frac{3}{9}$ correctly placed	3	**B1** for each pair
(b)(i)	$\frac{6}{56}$ oe	2	**M1** for *their* $\frac{3}{8}\times$ *their* $\frac{2}{7}$
(b)(ii)	$\frac{115}{168}$ oe	3	**M2** for *their* $\frac{3}{8}\times$ *their* $\frac{5}{7}+$ *their* $\frac{5}{8}\times$ *their* $\frac{6}{9}$ oe or **M1** for 1 of above products

37. 0607_s15_ms_41 Q: 12

Qu.	Answer	Mark	Part Marks
(a)	$\frac{4}{10}$, $\frac{9}{11}$ $\frac{2}{11}$, $\frac{8}{11}$ $\frac{3}{11}$	2	**B1** for one correct pair on 2nd bag
(b) (i)	$\frac{54}{110}$ oe cao	2	**M1FT** for $\frac{6}{10}$ × *their* $\frac{9}{11}$
(ii)	$\frac{44}{110}$ oe cao	3	**M2FT** for $\frac{6}{10}$ × *their* $\frac{2}{11}$ + $\frac{4}{10}$ × *their* $\frac{8}{11}$ oe or **M1FT** for one of above products
(c)	$\frac{66}{110}$ oe cao	3	**M2FT** for $\frac{6}{10}$ × *their* $\frac{9}{11}$ + $\frac{4}{10}$ × *their* $\frac{3}{11}$ or **(b)(i)** + $\frac{4}{10}$ × *their* $\frac{3}{11}$ or 1 – *their* **(b)(ii)** oe or **M1FT** for $\frac{6}{10}$ × *their* $\frac{9}{11}$ or $\frac{4}{10}$ × *their* $\frac{3}{11}$

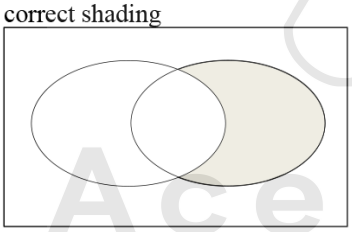
38. 0607_s15_ms_43 Q: 10

Qu.	Answer	Mark	Part Marks
(a)	$\frac{6}{10}, \frac{4}{10}$ oe	1	
	$\frac{4}{9}, \frac{3}{9}, \frac{2}{9}$ correctly positioned twice	1	
(b) (i)	$\frac{18}{90}$ oe	2	**M1** for $\frac{6}{10}\times\frac{3}{10}$
(ii)	$\frac{24}{90}$ oe	3	**M2 for** $\frac{6}{10}\times\frac{2}{9}+\frac{4}{10}\times\frac{2}{9}$ or **M1** for one of above products
(iii)	$\frac{64}{90}$ oe	3	**M2** for 1 – *their* **(b)(i)** – $\frac{4}{10}\times\frac{3}{9}$ oe **M1** for one of $\frac{6}{10}\times\frac{4}{9}$, $\frac{6}{10}\times\frac{2}{9}$, $\frac{4}{10}\times\frac{4}{9}$, $\frac{4}{10}\times\frac{3}{9}$

39. 0607_w15_ms_43 Q: 10

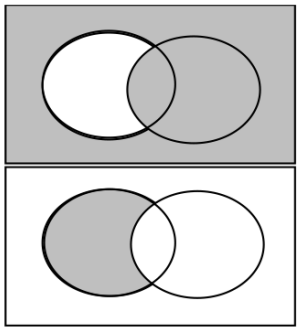
Question	Answer	Mark	Part Marks
(a)	$\frac{1}{3}$	**1**	
	$\frac{2}{5}$	**1**	
	$\frac{1}{10}$ and $\frac{9}{10}$	**1**	
(b)	$\frac{2}{3}\times\frac{3}{5}+\frac{1}{3}\times\frac{1}{10}$	**M2**	**M1** for one of these **FT** from **(a)**
(c)	$\frac{17}{30}$ and $\frac{12}{13}$	**1**	
	$\frac{8}{17}$ and $\frac{9}{17}$	**2**	**M1** for $\frac{17}{30}\times x=\frac{9}{30}$ oe

40. 0607_m21_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)(i)	15 nfww	**3**	**M2** for $8x = 104$ or better or **M1** for $3x + x + 2 + 4x + 1 + 8$ [=115] oe If 0 scored, **SC1** for 16 as final answer
(a)(ii)	correct shading 	**1**	
(a)(iii)	$\in$	**1**	
(b)(i)	$\frac{2}{9}$ oe	**1**	

Question	Answer	Marks	Partial Marks
(b)(ii)	$\frac{104}{153}$ oe	4	**M3** for $\frac{6}{18}\times\frac{4}{17}+\frac{6}{18}\times\frac{8}{17}+\frac{4}{18}\times\frac{6}{17}+\frac{4}{18}\times\frac{8}{17}+\frac{8}{18}\times\frac{6}{17}+\frac{8}{18}\times\frac{4}{17}$ oe or **M2** for 4 or 5 correct products added or **M1** for 2 or 3 correct products added OR **M3** for $\frac{6}{18}\times\frac{12}{17}+\frac{4}{18}\times\frac{14}{17}+\frac{8}{18}\times\frac{10}{17}$ or **M2** for 2 correct products added or **M1** for 1 correct product OR **M3** for $1-\left(\frac{6}{18}\times\frac{5}{17}+\frac{4}{18}\times\frac{3}{17}+\frac{8}{18}\times\frac{7}{17}\right)$ or **M2** for 1 – (two correct products added) or **M1** for 1 – one correct product If 0 scored **SC1** for final answer $\frac{52}{81}$ oe

41. 0607_w21_ms_41 Q: 12

Question	Answer	Marks	Partial Marks
(a)(i)		2	**B1** for each
(a)(ii)	$(A \cap B') \cup (A' \cap B)$ oe	1	
(b)(i)	$\frac{7}{60}$ oe	2	**M1** for $\frac{14}{40} \times \frac{13}{39}$
(b)(ii)	$\frac{50}{231}$ oe	3	**M2** for $\frac{5}{22} \times \frac{10}{21}$ or $\frac{10}{22} \times \frac{5}{21}$ oe or **M1** for $\frac{a}{22} \times \frac{b}{21}$ or $\frac{5}{k} \times \frac{10}{k-1}$ oe
(b)(iii)	$\frac{2}{247}$ oe	3	**M2** for $[k \times] \frac{5}{40} \times \frac{4}{39} \times \frac{8}{38}$ oe or **M1** for $\frac{a}{40} \times \frac{a-1}{39} \times \frac{b}{38}$ oe any integer k oe

42. 0607_s20_ms_41 Q: 8

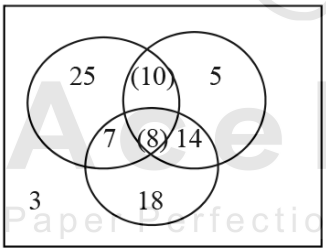
Question	Answer	Marks	Partial Marks
(a)(i)	0.3 0.9 and 0.1 0.2 and 0.8	3	**B1** for each

Question	Answer	Marks	Partial Marks
(a)(ii)	0.69 oe	3	**M2** for $0.7 \times 0.9 + 0.3 \times 0.2$ or **M1** for one correct product
(b)(i)	25	1	
(b)(ii)	$\frac{42}{870}$ oe	3	**M2** for $\frac{7}{30} \times \frac{6}{29}$ or **M1** for $\frac{p}{q} \times \frac{p-1}{q-1}$

43. 0607_w20_ms_43 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	20	**1**	
(a)(ii)	40	**1**	
(b)(i)	50	**1**	
(b)(ii)	47	**1**	
(b)(iii)	23	**1**	
(c)	$\frac{13}{50}$	**1**	**FT** *their* **(b)(i)**
(d)	$\frac{3}{175}$ oe	**2**	**M1** for $\frac{7}{their\,50}\times\frac{6}{their\,50-1}$
(e)	$\frac{7}{187}$ oe	**3**	**M2** for $\frac{7}{34}\times\frac{6}{33}$ or **M1** for $\frac{7}{p}\times\frac{6}{p-1}$

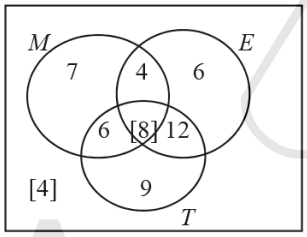
44. 0607_w19_ms_43 Q: 8

Question	Answer	Marks	Partial Marks
(a)	Correct Diagram  	**2**	Condone 3 omitted from outside region **B1** for 3 subsets correct
(b)	3	**1**	
(c)	$\frac{90}{8010}$ oe	**2**	**M1** for $\frac{10}{90}\times\frac{9}{89}$
(d)	$\frac{140}{2450}$	**3**	**M2** for $\frac{10}{50}\times\frac{their\,7}{49}+\frac{their\,7}{50}\times\frac{10}{49}$ oe or **M1** for one of these products

45. 0607_w18_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)	16	**1**	
(b)(i)	$\frac{7}{745}$ oe	**2**	**M1** for $\frac{15}{150} \times \frac{14}{149}$ oe with no extra products
(b)(ii)	$\frac{497}{2235}$ oe	**3**	**M2** for $\frac{71}{150} \times \frac{70}{149}$ oe with no extra products or **M1** for 35 + 12 + 24 soi by 71
(c)	$\frac{1640}{5673}$ oe	**3**	**M2** for $\frac{42}{63} \times \frac{41}{62} \times \frac{40}{61}$ oe with no extra products or **M1** for $\frac{15+27}{15+27+8+13}$ soi by $\frac{42}{63}$

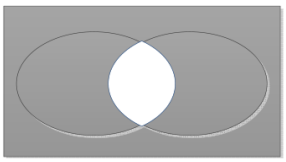
46. 0607_s17_ms_41 Q: 8

Question	Answer	Marks	Partial Marks
(a)	Correct values inside circles  	**3**	**B2** for 4 or 5 regions correct **B1** for 2 or 3 regions correct
(b)(i)	17	**1**	**FT** *their* diagram
(b)(ii)	11	**1**	**FT** *their* diagram

Question	Answer	Marks	Partial Marks
(c)	$\frac{4}{56}$ oe	2	**FT** *their* 4 **M1** for $\frac{\text{their } 4}{k}$ ($k >$ *their* 4) or $\frac{p}{56}$ ($p < 56$)
(d)	$\frac{1190}{3080}$ oe	2	**M1** for $\frac{35}{56} \times \frac{34}{55}$
(e)	$\frac{6}{25}$ oe	2	**FT** *their* 6 **M1** for $\frac{\text{their } 6}{k}$ ($k >$ *their* 6) or $\frac{p}{25}$ ($p < 25$)
(f)	$\frac{12}{870}$ oe	3	**M2** for $\frac{\text{their } 4}{30} \times \frac{(\text{their } 4)-1}{29}$ (*their* 4 < 30) or **M1** for $\frac{a}{30} \times \frac{a-1}{29}$ (*their* a < 30)

47. 0607_s17_ms_43 Q: 9

Question	Answer	Marks	Part Marks
(a)	15, 7, 12 correctly placed	2	**B1** for two correctly placed or **M1** for 41 – (40 – 6) seen oe or correct equation
(b)(i)	7	1	**FT** *their* Venn diagram
(b)(ii)	28	1	**FT** *their* Venn diagram
(c)	15	1	**FT** *their* Venn diagram
(d)	$\frac{462}{1560}$ oe	2	**M1** for $\frac{22}{40} \times \frac{21}{39}$
(e)(i)	$\frac{7}{19}$	1	**FT** *their* Venn diagram
(e)(ii)	$\frac{168}{342}$ oe	3	**M2** for $\frac{\text{their } 7}{19} \times \frac{\text{their } 12}{18} + \frac{\text{their } 12}{19} \times \frac{\text{their } 7}{18}$ oe or **M1** for one of these products
(f)	8	3	**M2** for $\frac{\text{their } 7+n}{40+n} = \frac{5}{16}$ oe or **M1** for at least two trials

Question	Answer	Marks	Part Marks
(g)		1	

48. 0607_w16_ms_41 Q: 5

Qu.	Answer	Mark	Part Marks
(a)	$18 - x + x + 12 - x + 3 = 25$ oe	M1	B1 for Venn diagram completed with the 10, 8, 4 and 3
	Completion to $x = 8$ with at least one step	A1	
(b) (i)	$\frac{22}{25}$ oe	1	0.88
(ii)	$\frac{21}{25}$ oe	1	0.84

Qu.	Answer	Mark	Part Marks
(c)	$\frac{8}{18}$ oe	1	$\frac{4}{9}$, 0.4444…
(d)	element chosen from Q is also in P oe	1	