Paper – 22.2

Q1.

An ordinary unbiased die has faces numbered 1, 2, 3, 4, 5 and 6. Sarah and Terry each threw this die once. Expressing each answer as a fraction in its lowest terms, find the probability that

(i) Sarah threw a 7, [1]

(ii) they both threw a 6, [1]

(iii) neither threw an even number, [1]

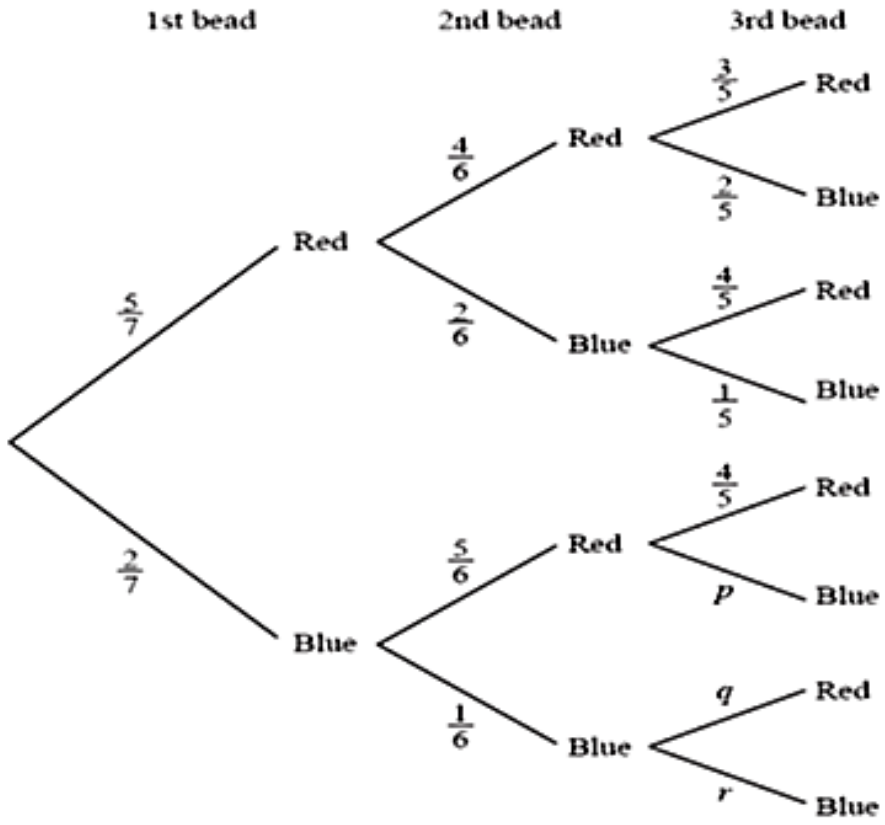
(iv) Sarah threw exactly four more than Terry. [1]

Q2.

A bag contained 5 Red and 2 Blue beads. Chris took 3 beads, at random, and without replacement, from the bag.

The probability tree shows the possible outcomes and their probabilities.

(i) Write down the values of p, q and r. [2]



(ii) Expressing each answer as a fraction in its lowest terms, find the probability that

(a) Three Red beads were taken, [1]

(b) The first bead was Red, the second Blue and the third Red, [1]

(c) Two of the beads were Red and one was Blue. [2]

Q3.

Tina has two fair, normal 6-sided dice. One is red and the other is blue. She throws both of them once. You may find it helpful to draw a possibility diagram to answer the following questions. Find, as a fraction in its lowest terms, the probability that

(i) The red die shows a 2 and the blue die does not show a 2, [1]

(ii) The sum of the two numbers shown is equal to 5, [1]

(iii) One die shows a 3 and the other shows an even number. [2]

Q4.

Mary's score for the turn is worked out using the formula $xm + yn$, where x is the number on spinner X and y is the number on spinner Y.
The possibility space diagram shows Mary's possible scores.

		x (number on spinner X)			
		5	7	11	p
y (number on spinner Y)	−4	37	47	67	97
	−1	28	38	58	88
	3	16	26	46	76
	4	13	23	43	73

(a) Find the probability that Mary's score is less than 15. [1]

(b) Calculate the probability that on two consecutive turns, Mary scores less than 40 on one and more than 75 on the other. [3]

(c) The diagram shows 7 on spinner X and −1 on spinner Y.
Using the formula, the score for this turn is $7m - n = 38$.

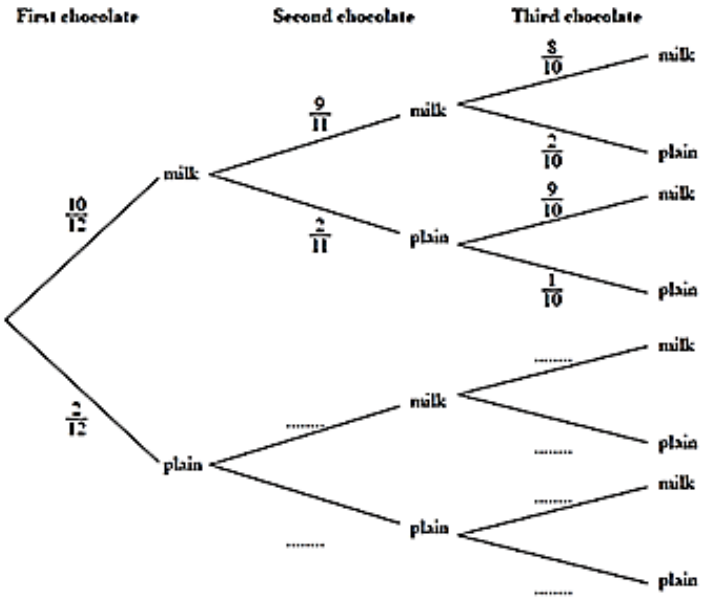
(i) Using the table, find $7m + 3n$. [1]

(ii) Hence find m and n. [2]

(d) Find p. [2]

Q5.

(a) A box of chocolates contains 10 milk chocolates and 2 plain chocolates.
Sacha eats 3 chocolates chosen at random from the box.
The tree diagram shows the possible outcomes and their probabilities.



(i) Complete the tree diagram. **[2]**

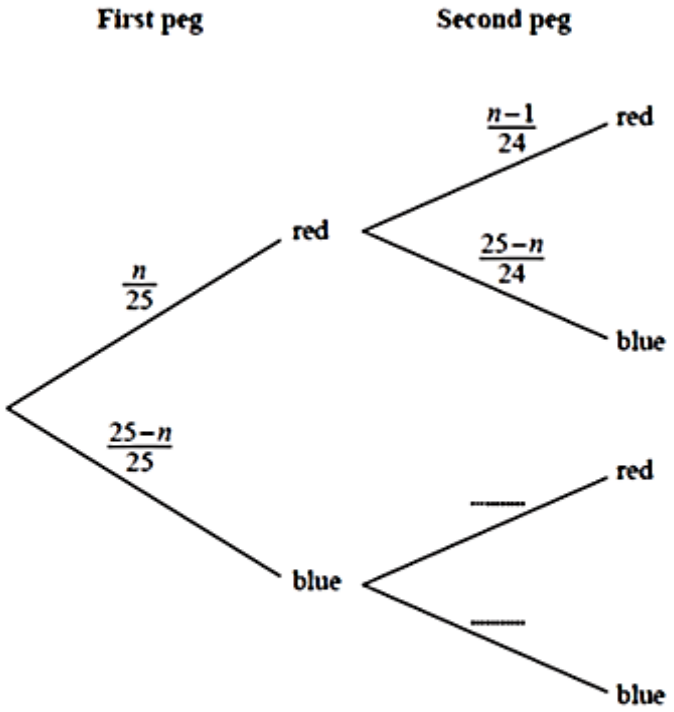
(ii) Expressing each answer as a fraction in its lowest terms, find the probability that Sacha

(a) eats 3 milk chocolates, **[1]**

(b) eats 2 milk chocolates and 1 plain chocolate in any order. **[2]**

Q6.

(a) A bag contains red and blue pegs.
Altogether there are 25 pegs of which n are red.
Rashid picks two pegs without replacement.
The tree diagram shows the possible outcomes and their probabilities.



(i) Complete the tree diagram. [2]

(ii) **(a)** Write an expression, as a single fraction in terms of n, for the probability that Rashid picks a red peg then a blue peg in that order. [1]

(b) The probability that Rashid picks a red peg then a blue peg in that order is $\frac{1}{p}$.

Given that the number of red pegs, n, satisfies the equation $n^2 - 25n + 150 = 0$,
find p. [2]

Answers: Paper 22.2

$Q1i)\ 0\quad Q1ii)\frac{1}{36}\quad Q1iii)\frac{1}{2}\quad Q1iv)\frac{1}{36}\qquad Q2i)\ p=\frac{1}{5}, q=1, r=0\quad Q2iia)\ \frac{2}{7}\quad Q2iib)\ \frac{4}{21}\quad Q2iic)\ \frac{4}{7}$

$Q3i)\ \frac{5}{36}\quad Q3ii)\ \frac{1}{9}\quad Q3iii)\ \frac{1}{6}$

$Q4a)\ \frac{1}{16}\quad Q4b)\ \frac{21}{128}\quad Q4ci)\ 7m+3n=26\quad Q4cii)\ m=5, n=-3\quad Q4d)\ p=17$

Q5ai) $\frac{10}{11}, \frac{1}{11}, \frac{9}{10}, \frac{1}{10}, \frac{01}{10}, \frac{0}{10}$ Q5aiia) 6/11, Q5aiib) 9/22

Q6ai) n/24, (24 – n)/24 Q6aiia) $\frac{n(25-n)}{25\times24}$ Q6aiib) p=4,