Name: _____

GCSE (1 – 9)

Probability Trees

Instructions

• Use **black** ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided
– *there may be more space than you need.*
• Diagrams are **NOT** accurately drawn, unless otherwise indicated.
• You must **show all your working out.**

Information

• The marks for each question are shown in brackets
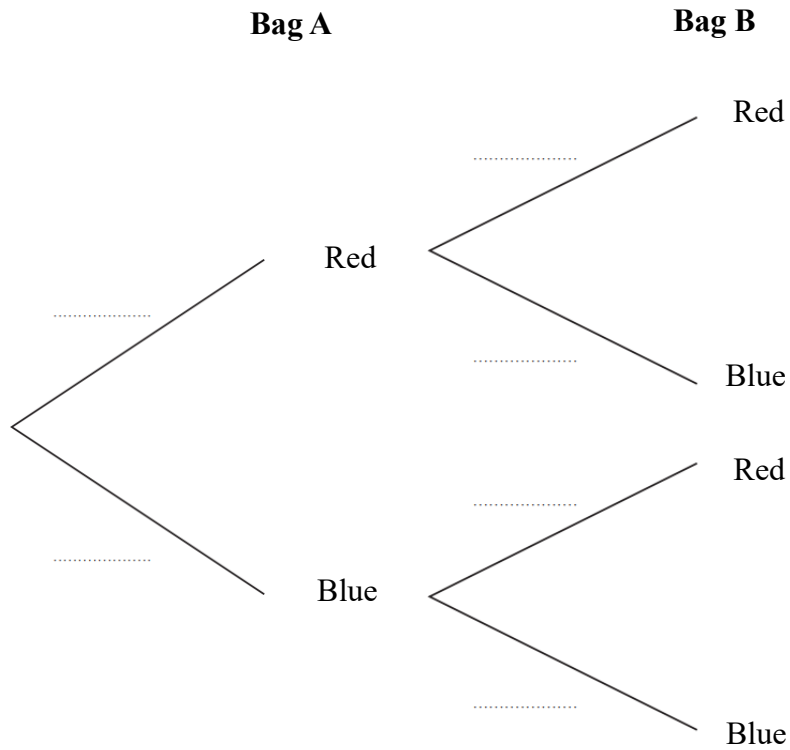– *use this as a guide as to how much time to spend on each question.*

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
• Check your answers if you have time at the end

1 Tina has two bags of counters, Bag A and Bag B.

There are 5 red counters and 3 blue counters in bag A.
There are 4 red counters and 5 blue counters in bag B.

Tina takes at random a counter from each bag.

(a) Complete the probability tree diagram.

Bag A   **Bag B**

                                      Red

                    Red

                                      Blue

                                      Red

                    Blue

                                      Blue

(2)

(b) Work out the probability that Tina takes two blue counters.
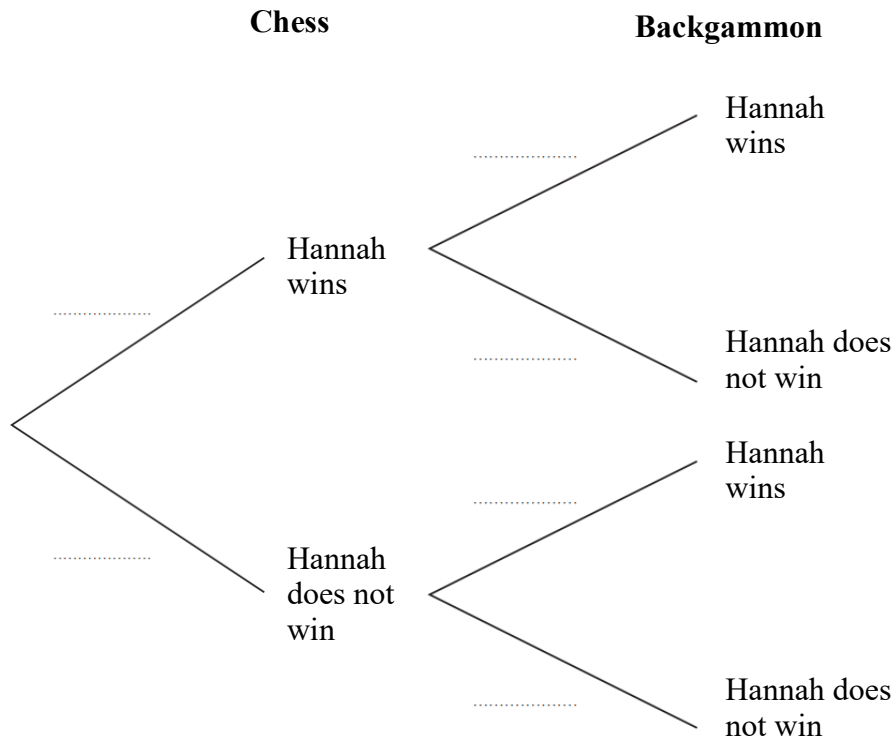
(2)

(Total for question 1 is 4 marks)

2   Hannah is going to play one game of chess and one game of backgammon.

The probability she will win the game of chess is 0.6
The probability she will win the game of backgammon is 0.7.

(a) Complete the probability tree diagram.

Chess   **Backgammon**

.... Hannah wins

Hannah wins

....

.... Hannah does not win

....

Hannah does not win

.... Hannah wins

.... Hannah does not win

(2)

(b) Work out the probability that Hannah will win both games.

....
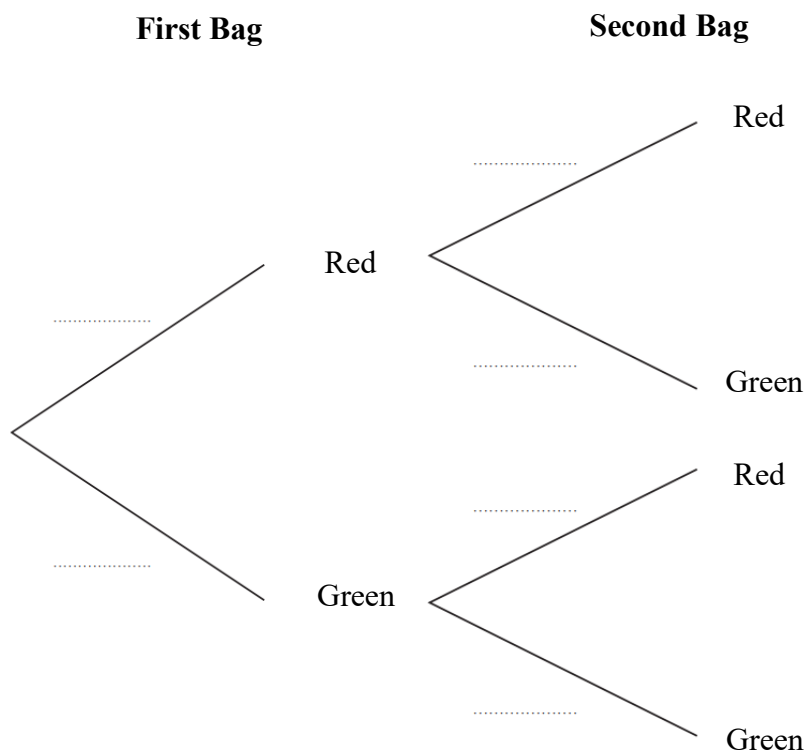
(2)

(Total for question 2 is 4 marks)

3   Rachel has two bags.

In the first bag there are 4 red balls and 6 green balls.
In the second bag there are 3 red balls and 5 green balls.

Rachel takes at random a ball from the first bag.
She then takes at random a ball from the second bag.

(a) Complete the probability tree diagram.

<div style="text-align:center">

First Bag   **Second Bag**

</div>

Red

.... Red

.... Green

Green

.... Red

.... Green

....

....

(2)

(b) Work out the probability that Rachel takes two green balls.

....
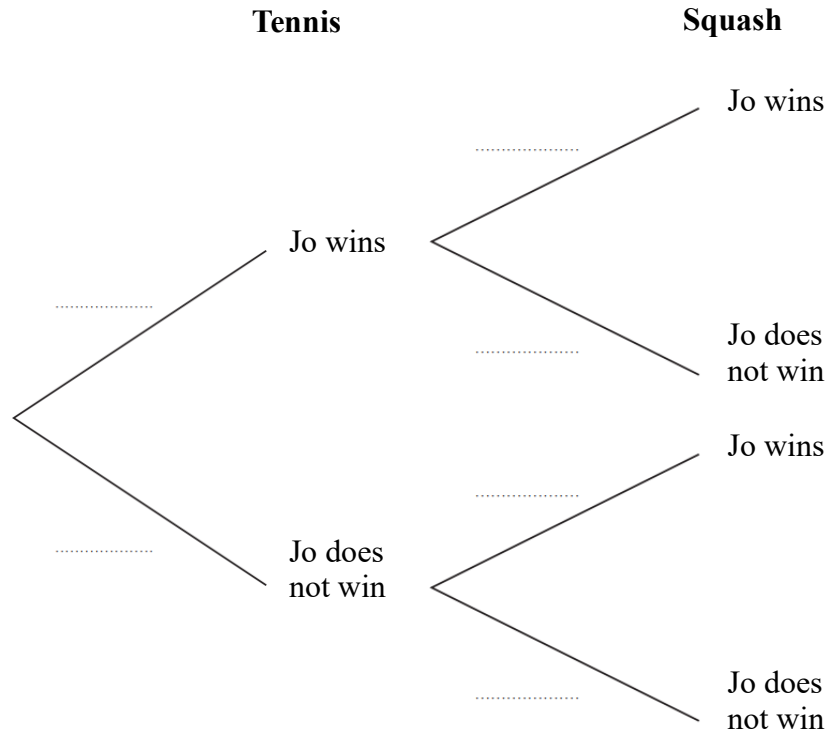
(2)

(Total for question 3 is 4 marks)

4   Jo is going to play one tennis match and match of squash.

The probability she will win the tennis match is $\frac{4}{5}$

The probability she will win the squash match is $\frac{7}{10}$

(a) Complete the probability tree diagram.

Tennis	Squash

                                              .... Jo wins

                                    Jo wins

                          ....
                                              .... Jo does
                                                               not win

                                              .... Jo wins

                          ....
                                    Jo does
                                    not win

                                              .... Jo does
                                                               not win

(2)

(b) Work out the probability that Jo will win both matches.

....
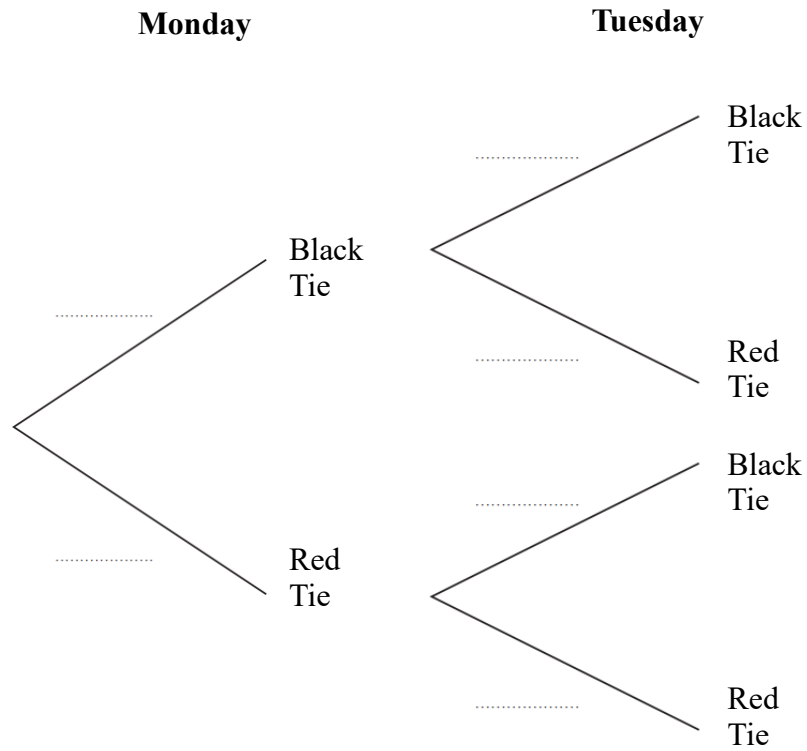
(2)

(Total for question 4 is 4 marks)

5   Each day Paul wears either a black tie or a red tie to work.

On any day the probability he wears a black tie is $\frac{5}{9}$

(a) Complete the probability tree diagram for Monday and Tuesday.

Monday   **Tuesday**

(2)

(b) Work out the probability Paul wears different coloured ties on Monday and Tuesday .

....
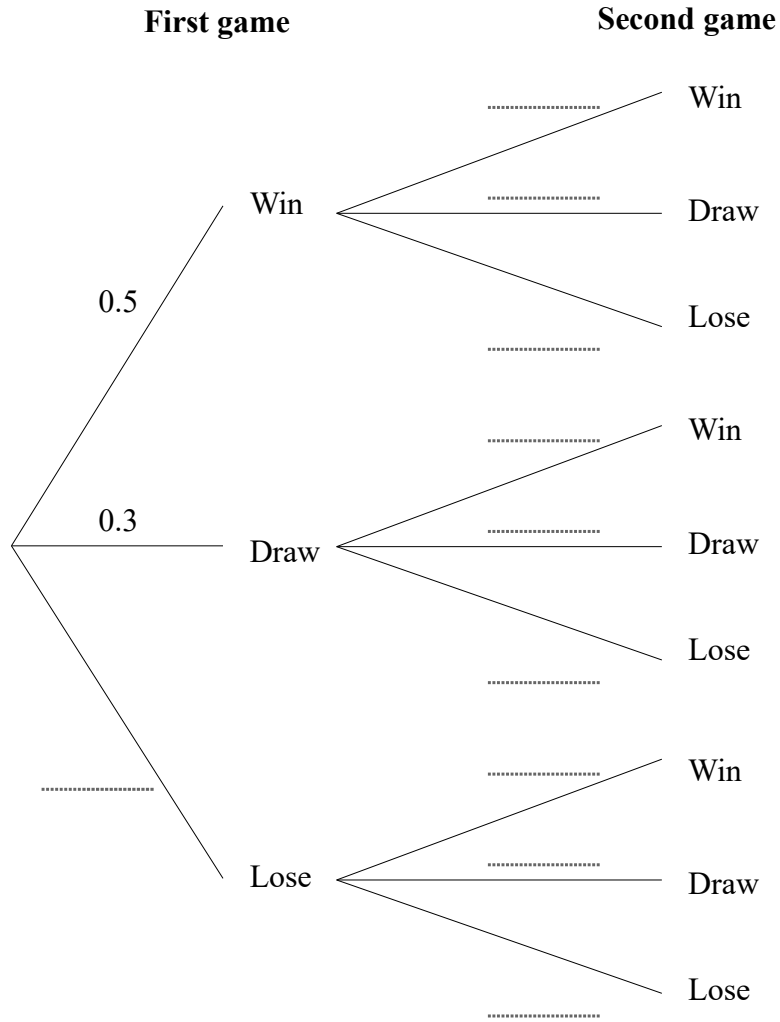
(2)

(Total for question 5 is 4 marks)

6 Jon plays a game where he can win, draw or lose.

The probability Jon wins any game 0.5.
The probability Jon draws any game is 0.3

Jon plays two games.

(a) Complete the probability tree diagram

First game   **Second game**

                                               .... Win

                   Win .... Draw

   0.5 .... Lose

                                                 .... Win

   0.3 Draw .... Draw

                  .... Lose

                                               .... Win

   .... Lose .... Draw

                  .... Lose

(b) Work out the probability Jon wins both games.

(2)

....
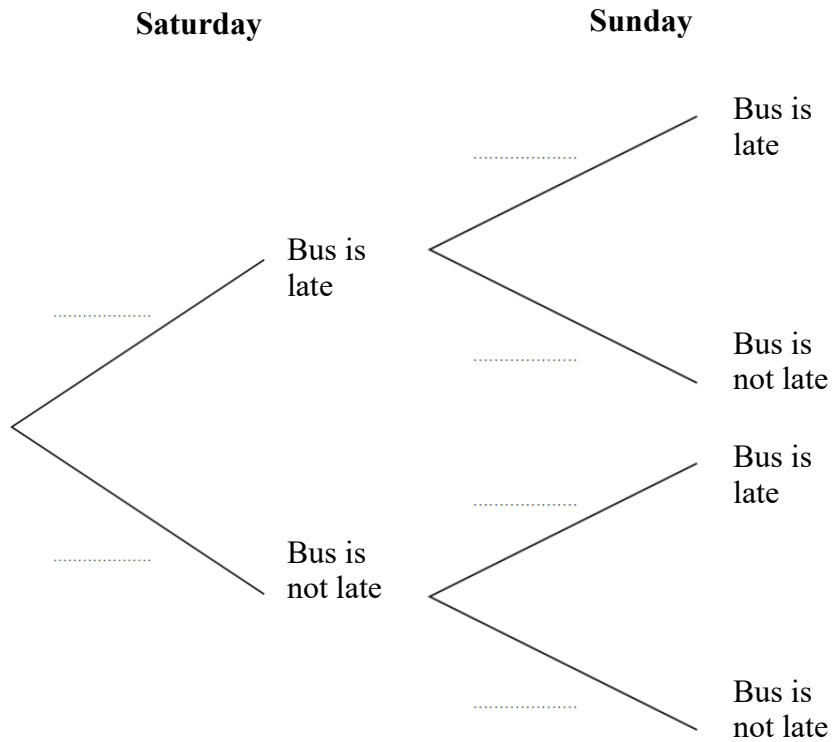
(2)

(Total for question 6 is 4 marks)

7   Bradley gets the bus on Saturday and Sunday.
The probability that Bradley's bus will be late on any day is 0.2

(a) Complete the probability tree diagram.

Saturday   **Sunday**

                                                                Bus is
                                                                late
                                        ....
                        Bus is
                        late
        ....
                                                                Bus is
                                        ....   not late

                                                                Bus is
                                        ....   late
        ....   Bus is
                        not late
                                                                Bus is
                                        ....   not late

(2)

(b) Work out the probability that Bradley's bus is late on at least one of these days.

....
(2)
(Total for question 7 is 4 marks)

2   Hannah is going to play one game of chess and one game of backgammon.

The probability she will win the game of chess is 0.6
The probability she will win the game of backgammon is 0.7.

Work out the probability that Hannah will win exactly one of these games.

....

(Total for question 2 is 3 marks)

3 Rachel has two bags.

In the first bag there are 4 red balls and 6 green balls.
In the second bag there are 3 red balls and 5 green balls.

Rachel takes at random a ball from the first bag.
She then takes at random a ball from the second bag.

Work out the probability that Rachel takes two green balls.

....

(Total for question 3 is 3 marks)

6   Jon plays a game where he can win, draw or lose.

The probability Jon wins any game 0.5.
The probability Jon draws any game is 0.3

Jon plays two games.

Work out the probability Jon wins exactly one game.

....

(Total for question 6 is 3 marks)