Probability - topic test

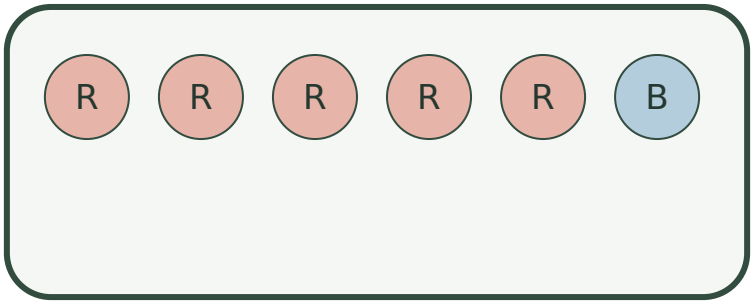
12 questions | 21 marks | 30 minutes

Begin with familiar ideas, then explain and apply your understanding. Show your working.

Equivalent correct methods earn the corresponding marks.

1. A bag has five red and one blue equal-sized ball. Which colour is more likely on a random draw? [1 mark]

Equal-sized balls in a mixed bag



R = red, B = blue, G = green

There are more red balls.

Answer: Red.

2. The bag in this question contains only red and blue balls. Describe the chance of drawing green. [1 mark]

There are no green balls.

Answer: Impossible.

3. A box contains only white counters. Describe the chance of drawing white. [1 mark]

Every available counter is white.

Answer: Certain.

4. A fair coin has heads and tails. Compare their chances. [1 mark]

Neither side has a greater chance in the stated fair setup.

Answer: Equally likely.

5. Order these from least to most likely: likely, impossible, certain, unlikely. [2 marks]

Use the two extremes and the words between them.

Answer: Impossible, unlikely, likely, certain.

6. A bag has three red and two blue balls. One red is kept out. State the remaining contents. [2 marks]

Remove the known red ball.

Answer: Two red and two blue.

7. A bag starts with three red and two blue balls. One red ball is drawn and kept out. Does that draw affect the chances of the next draw? Explain. [2 marks]

Without replacement the collection changes; red and blue become equally likely.

Answer: Yes.

8. A drawn counter is returned and the bag is mixed. Do the colour counts change before the next draw? [2 marks]

Replacement restores the original counts.

Answer: No.

9. Count the heads and tails in this record: H, H, T, H, T, T, H, T, H, T. [2 marks]

There are ten results: five of each.

Answer: 5 heads and 5 tails.

10. Ten tosses of a fair coin produce seven heads. Must the next toss be tails? Explain. [2 marks]

The next toss is independent; an earlier result does not force tails.

Answer: No.

11. Two groups each make ten fair-coin tosses. One records 4 heads and the other 6 heads. Explain why both records may be correct. [2 marks]

Equal chances do not require equal counts in every small batch.

Answer: Chance variation can give different counts under the same fair rule.

12. Design a fair bag game where red wins and blue loses. State the contents and how to draw. [3 marks]

Equal colour counts with equally likely individual balls give equally likely win/loss outcomes.

Answer: For example: use 3 red and 3 blue equal-sized balls, mix, and draw one without looking.