



2.3D Systematic Listing: Fluency and Exam Drill

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 40 minutes

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Work out how many different outcomes there are when a 6-sector spinner numbered 1 to 6 is spun once and a coin is flipped once.

(Total for Question 1 is 1 mark)

- 2** A shop sells shirts in red or blue and trousers in black or grey. List all possible outfits that consist of one shirt and one pair of trousers.

(Total for Question 2 is 2 marks)

- 3** How many different 2-letter arrangements are there using the letters A, B and C if no letter is used more than once?

(Total for Question 3 is 1 mark)

- 4** List all the 2-letter arrangements from the letters A, B and C if no letter is used more than once.

(Total for Question 4 is 2 marks)

- 5** Work out how many different 3-course meals can be made if you choose one starter from {soup, salad}, one main from {fish, chicken, vegetarian} and one dessert from {cake, fruit}.

(Total for Question 5 is 1 mark)

- 6** Olivia chooses two different fruits from apple, banana, cherry and date to make a smoothie. Order does not matter. How many choices are there?

(Total for Question 6 is 2 marks)

- 7** A fair coin is flipped and then a spinner showing the numbers 1, 2, 3 and 4 is spun. Work out the number of possible outcomes in which the spinner shows an even number.

(Total for Question 7 is 2 marks)

- 8** List all ordered pairs of numbers shown on two six-sided dice that add to 7.

(Total for Question 8 is 3 marks)

- 9** How many 4-character codes can be made if each character is chosen from the set {A, B, C, D} and repetition of characters is allowed?

(Total for Question 9 is 2 marks)

- 10** A password consists of two different letters chosen from {A, B, C} followed by one digit chosen from {1, 2, 3, 4}. Work out how many passwords are possible.

(Total for Question 10 is 3 marks)

- 11** From five people, a president and a secretary are to be chosen. How many different ways can this be done?

(Total for Question 11 is 2 marks)

- 12** Priya chooses two scoops of ice cream from 5 flavours.

(a) If the order of scoops matters (first scoop then second) and the same flavour can be chosen twice, how many ordered pairs of scoops are possible? (2)

(b) If the order of scoops does not matter but the same flavour can be chosen twice (so scoops like strawberry + vanilla and vanilla + strawberry are the same), how many different unordered selections are possible? (2)

(Total for Question 12 is 4 marks)

- 13** How many different 3-digit codes are possible using the digits 1 to 5 if no digit is repeated within a code?

(Total for Question 13 is 3 marks)

- 14** Ali must select a committee of 3 people from 6 people. How many different committees are possible? (Order of selection does not matter.)

(Total for Question 14 is 2 marks)

Mark scheme · 2.3D Systematic Listing: Fluency and Exam Drill

Question 1

- **B1** 12 cao
- **Answer:** 12

Question 2

- **M1** systematic list of outfits shown, e.g. pairings shown clearly
- **A1** four distinct outfits listed: red/black, red/grey, blue/black, blue/grey cao
- **Answer:** red/black; red/grey; blue/black; blue/grey

Question 3

- **B1** 6 cao
- **Answer:** 6

Question 4

- **M1** systematic listing of ordered pairs or arrangements (eg start with A then B,C; then B then A,C; then C then A,B) oe
- **A1** all six: AB, AC, BA, BC, CA, CB cao
- **Answer:** AB, AC, BA, BC, CA, CB

Question 5

- **B1** 12 cao
- **Answer:** 12

Question 6

- **M1** use combination or $4 \times 3/2$ oe
- **A1** 6 cao
- **Answer:** 6

Question 7

- **M1** identify 2 even spinner outcomes and multiply by 2 coin outcomes (2×2) oe
- **A1** 4 cao
- **Answer:** 4

Question 8

- **M1** some correct ordered pairs shown systematically (eg (1,6),(2,5),(3,4))
- **M1** remaining correct ordered pairs shown systematically (eg (4,3),(5,2),(6,1))
- **A1** all six ordered pairs listed: (1,6),(2,5),(3,4),(4,3),(5,2),(6,1) cao
- **Answer:** (1,6), (2,5), (3,4), (4,3), (5,2), (6,1)

Question 9

- **M1** recognise 4 choices for each of 4 positions and set up 4^4 oe
- **A1** 256 cao
- **Answer:** 256

Question 10

- **M1** number of ways to choose two different letters: 3×2 oe
- **M1** multiply by 4 choices for the digit: 6×4 oe
- **A1** 24 cao
- **Answer:** 24

Question 11

- **M1** 5 choices for president then 4 choices for secretary, 5×4 oe
- **A1** 20 cao
- **Answer: 20**

Question 12

- (a) **M1** recognise 5 choices for first scoop and 5 for second, 5×5 oe
- (a) **A1** 25 cao
- (a) **Answer: 25**
- (b) **M1** use combinations with repetition: $C(5+2-1, 2)$ or $(5 \times 6)/2$ oe
- (b) **A1** 15 cao
- (b) **Answer: 15**

Question 13

- **M1** recognise 5 choices for first digit, 4 for second, 3 for third ($5 \times 4 \times 3$) oe
- **M1** calculate $5 \times 4 \times 3$ oe
- **A1** 60 cao
- **Answer: 60**

Question 14

- **M1** use combinations: $C(6, 3) = 6 \times 5 \times 4 / 3 \times 2 \times 1$ oe
- **A1** 20 cao
- **Answer: 20**