

Arrangements, Combinations & Probability

Question Paper 1

Level	A Level
Subject	Maths
Exam Board	OCR - MEI
Module	Statistics 1
Topic	Binomial Distribution & Hypothesis Testing
Sub Topic	Arrangements, Combinations & Probability
Booklet	Question Paper 1

Time Allowed: 58 minutes

Score: /48

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

- 1 A rugby team of 15 people is to be selected from a squad of 25 players.

 - (i) How many different teams are possible? [2]
 - (ii) In fact the team has to consist of 8 forwards and 7 backs. If 13 of the squad are forwards and the other 12 are backs, how many different teams are now possible? [2]
 - (iii) Find the probability that, if the team is selected at random from the squad of 25 players, it contains the correct numbers of forwards and backs. [2]
- 2 There are 16 girls and 14 boys in a class. Four of them are to be selected to form a quiz team. The team is to be selected at random.

 - (i) Find the probability that all 4 members of the team will be girls. [3]
 - (ii) Find the probability that the team will contain at least one girl and at least one boy. [3]
- 3 An examination paper consists of two sections. Section A has 5 questions and Section B has 9 questions. Candidates are required to answer 6 questions.

 - (i) In how many different ways can a candidate choose 6 questions, if 3 are from Section A and 3 are from Section B? [3]
 - (ii) Another candidate randomly chooses 6 questions to answer. Find the probability that this candidate chooses 3 questions from each section. [3]
- 4 I have 5 books, each by a different author. The authors are Austen, Brontë, Clarke, Dickens and Eliot.

 - (i) If I arrange the books in a random order on my bookshelf, find the probability that the authors are in alphabetical order with Austen on the left. [2]
 - (ii) If I choose two of the books at random, find the probability that I choose the books written by Austen and Brontë. [3]

- 5 There are 13 men and 10 women in a running club. A committee of 3 men and 3 women is to be selected.
- (i) In how many different ways can the three men be selected? [2]
- (ii) In how many different ways can the whole committee be selected? [2]
- (iii) A random sample of 6 people is selected from the running club. Find the probability that this sample consists of 3 men and 3 women. [2]
- 6 Three prizes, one for English, one for French and one for Spanish, are to be awarded in a class of 20 students.
- Find the number of different ways in which the three prizes can be awarded if
- (i) no student may win more than 1 prize, [2]
- (ii) no student may win all 3 prizes. [2]
- 7 There are 14 girls and 11 boys in a class. A quiz team of 5 students is to be chosen from the class.
- (i) How many different teams are possible? [2]
- (ii) If the team must include 3 girls and 2 boys, find how many different teams are possible. [3]
- 8 Thomas has six tiles, each with a different letter of his name on it.
- (i) Thomas arranges these letters in a random order. Find the probability that he arranges them in the correct order to spell his name. [2]
- (ii) On another occasion, Thomas picks three of the six letters at random. Find the probability that he picks the letters T, O and M (in any order). [3]

- 9 Codes of three letters are made up using only the letters A, C, T, G. Find how many different codes are possible
- (i) if all three letters used must be different, [3]
- (ii) if letters may be repeated. [2]