



**CAMBRIDGE 'A' LEVEL PROGRAMME
FIRST SEMESTER EXAMINATION JUNE 2005**

(January 2005 Intake)

Friday

10 June 2005

10.30 am – 11.45 am

MATHEMATICS

9709/6

PAPER 6 Probability & Statistics 1 (S1)

1 hour 15 minutes

Additional materials: Answer Paper
List of formulae (MF9)
Graph Paper

READ THESE INSTRUCTIONS FIRST

Write your name and class on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use a soft pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** the questions.

Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total marks for this paper is 50.

Questions carrying smaller numbers of marks are printed earlier in the paper, and questions carrying larger numbers of marks later in the paper.

The use of an electronic calculator is expected, where appropriate.

You are reminded of the need for clear presentation in your answers.

This document consists of 3 printed pages.

1. Each day a bakery delivers the same number of buns to a certain shop which sells, on average, 98% of them. Assuming that the number of buns sold per day has a binomial distribution with a standard deviation of 7, find the number of buns the shop would sell per day. [4]

2. The letters of the word MATHEMATICS are written, one on each of 11 separate cards. The cards are laid out in a line.
 - (i) In how many ways can these letters be arranged? [2]
 - (ii) Calculate the number of different arrangements of these letters where the vowels are together. [4]

3. The probability that a golfer hits the ball on to the green if it is windy as he strikes the ball is 0.4, and the corresponding probability if it is not windy as he strikes the ball is 0.7. The probability that the wind will blow as he strikes the ball is 0.3. Calculate the probability that
 - (i) he hits the ball on to the green, [3]
 - (ii) it was not windy, given that he does not hit the ball on to the green. [3]

4. An unbiased cubical die has number 1 on one face, the number 2 on two faces and the number 3 on three faces. The die is rolled twice and X is the total score.
 - (i) Tabulate the probability distribution of X . [4]
 - (ii) Calculate the expectation and variance of X . [3]

5. The average weekly wages , taken to the nearest ringgit (RM), of 200 factory workers were recorded and are shown in the table below.

Weekly wages (RM)	Number of workers
105 – 124	10
125–144	16
145–164	38
165–184	52
185–204	40
205–224	28
225–244	16

- (i) Draw a cumulative frequency polygon for the above data. [4]
- (ii) Estimate the interquartile range of the wages. [2]
- (iii) From the graph, estimate the percentage of workers receiving more than RM200 per week. [2]
6. The heights of male students at a particular school are normally distributed with a mean of 169 cm and a standard deviation of 9 cm.
- (i) Given that 80% of these male students have a height less than y cm, find the value of y . [4]
- (ii) Given that 60% of these male students have a height greater than x cm, find the value of x . [5]
7. Bolts from a production line are examined for any defects. The probability that any bolt will be found to be defective is 0.15, independently of all other bolts.
- (i) A batch of 16 bolts is inspected. Calculate the probability that the number of defective bolts in the batch is
- a) exactly 3, [2]
- b) at least 4. [3]
- (ii) A batch of 80 bolts is inspected. Use a normal approximation to the binomial distribution to find the probability that a least 8 bolts in the batch are defective. [5]