

Centre Number					Candidate Number				
Surname									
Other Names									
Candidate Signature									

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	



General Certificate of Education
Advanced Level Examination
June 2010

Mathematics

MS2B

Unit Statistics 2B

Friday 18 June 2010 1.30 pm to 3.00 pm

For this paper you must have:

- the blue AQA booklet of formulae and statistical tables.
- You may use a graphics calculator.

Time allowed

- 1 hour 30 minutes

Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Write the question part reference (eg (a), (b)(i) etc) in the left-hand margin.
- You must answer the questions in the spaces provided. Do not write outside the box around each page.
- Show all necessary working; otherwise marks for method may be lost.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- The **final** answer to questions requiring the use of tables or calculators should normally be given to three significant figures.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 75.

Advice

- Unless stated otherwise, you may quote formulae, without proof, from the booklet.



J U N 1 0 M S 2 B 0 1

- 5** The number of telephone calls received, during an 8-hour period, by an IT company that request an urgent visit by an engineer may be modelled by a Poisson distribution with a mean of 7.
- (a)** Determine the probability that, during a given 8-hour period, the number of telephone calls received that request an urgent visit by an engineer is:
- (i)** at most 5 ; *(1 mark)*
 - (ii)** exactly 7 ; *(2 marks)*
 - (iii)** at least 5 but fewer than 10 . *(3 marks)*
- (b)** Write down the distribution for the number of telephone calls received each hour that request an urgent visit by an engineer. *(1 mark)*
- (c)** The IT company has 4 engineers available for urgent visits and it may be assumed that each of these engineers takes exactly 1 hour for each such visit.
- At 10 am on a particular day, all 4 engineers are available for urgent visits.
- (i)** State the maximum possible number of telephone calls received between 10 am and 11 am that request an urgent visit and for which an engineer is immediately available. *(1 mark)*
 - (ii)** Calculate the probability that at 11 am an engineer will **not** be immediately available to make an urgent visit. *(4 marks)*
- (d)** Give a reason why a Poisson distribution may not be a suitable model for the number of telephone calls per hour received by the IT company that request an urgent visit by an engineer. *(1 mark)*

QUESTION
PART
REFERENCE

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QUESTION
PART
REFERENCE

A large rectangular area with horizontal dotted lines for writing, intended for student answers.

END OF QUESTIONS

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