OCR
Oxford Cambridge and RSA

Tuesday 16 June 2015 – Afternoon

A2 GCE MATHEMATICS (MEI)

4754/01B Applications of Advanced Mathematics (C4) Paper B: Comprehension

QUESTION PAPER

Duration: Up to 1 hour
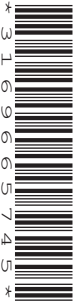
Candidate forename		Candidate surname	

Centre number						Candidate number					

INSTRUCTIONS TO CANDIDATES

*   The Insert will be found inside this document.
*   Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
*   Use black ink. HB pencil may be used for graphs and diagrams only.
*   Answer **all** the questions.
*   Read each question carefully. Make sure you know what you have to do before starting your answer.
*   Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
*   Do **not** write in the bar codes.
*   The Insert contains the text for use with the questions.
*   You are permitted to use a scientific or graphical calculator in this paper.
*   Final answers should be given to a degree of accuracy appropriate to the context.

INFORMATION FOR CANDIDATES

*   The number of marks is given in brackets **[ ]** at the end of each question or part question.
*   You may find it helpful to make notes and do some calculations as you read the passage.
*   You are **not** required to hand in these notes with your question paper.
*   You are advised that an answer may receive **no marks** unless you show sufficient detail of the working to indicate that a correct method is being used.
*   The total number of marks for this paper is **18**.
*   This document consists of **8** pages. Any blank pages are indicated.

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Turn over

1   In a building with a single lift, the car is located on the ground floor. The following calls arrive in quick succession, all before the car has started on its upward journey.

> Passenger P on floor 9 calls for a down-car (intending to go to floor 1);
> Passenger Q on floor 5 calls for an up-car (intending to go to floor 10);
> Passenger R on floor 4 calls for a down-car (intending to go to floor 1).

The following events need to take place, but not necessarily in the order given.

E1. Pick up P
E2. Pick up Q
E3. Pick up R
E4. Drop off P and R
E5. Drop off Q

Assuming the car serves requests as described in lines 16 to 20,

   (i) which event occurs first?   **[1]**

   (ii) which event occurs second?   **[1]**

   (iii) which event occurs last?   **[1]**

1 (i)	
1 (ii)	
1 (iii)	

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2 In line 79 it says "For most journeys, more than half the journey time is composed of load time and transfer time". For what percentage of the journey time for the round trip made by car A in Table 4 is the car stationary? **[2]**

2	

3 Using the expression on line 51, work out the answer to the question on lines 39 and 40 for the case where there are 10 upper floors and 7 people. Give your answer to 2 decimal places. **[2]**

3	

4 In lines 89 and 90 it says "… on average there will be approximately 8 stops per trip. A round trip with 8 stops would take between 188 and 200 seconds". Explain how the figure of 188 seconds has been derived. **[2]**

4	

Turn over

5 **(i)** Referring to Strategy 3 and lines 99 to 101, complete the table below for car C. **[3]**

(ii) Calculate the time car C will take to transport all the people who work on floors 7 and 8, and return to the ground floor. **[1]**

5(i)			
		Car C	
		Arrival time (seconds)	Departure time (seconds)
	Ground floor	0	20
	Floor 1		
	Floor 2		
	Floor 3		
	Floor 4		
	Floor 5		
	Floor 6		
	Floor 7		
	Floor 8		
	Floor 9		
	Floor 10		
	Return to ground floor		

5(ii)

6   8 people make independent visits to any one of the upper floors of a building with 10 upper floors. What is the probability that at least one of the visitors goes to the top floor? **[2]**

7   On lines 94 and 95 it says "Table 4 gives the timings for round trips in which the cars are required to stop at every floor they serve; Table 2 suggests this is a common occurrence in this case". Explain how Table 2 is used to make this claim. **[3]**

END OF QUESTION PAPER

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