



Oxford Cambridge and RSA

Tuesday 3 June 2025 – Afternoon

AS Level Further Mathematics B (MEI)

Y413/01 Modelling with Algorithms

Printed Answer Booklet

Time allowed: 1 hour 15 minutes



You must have:

- Question Paper Y413/01 (inside this document)
- the Formulae Booklet for Further Mathematics B (MEI)
- a scientific or graphical calculator



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

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Candidate number

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First name(s)

Last name

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided in the **Printed Answer Booklet**. If you need extra space use the lined page at the end of the Printed Answer Booklet. The question numbers must be clearly shown.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- Give your final answers to a degree of accuracy that is appropriate to the context.

INFORMATION

- This document has **12** pages.

ADVICE

- Read each question carefully before you start your answer.

1

	A	B	C	D	E	F	G	H	I	J
A		12	6		7		8			2
B	12		5	14		9				
C	6	5					10			7
D		14						3		8
E	7					6			4	9
F		9			6					
G	8		10						5	
H				3						11
I					4		5			
J	2		7	8	9			11		

Order of arcs:

Total length of arcs in MST:

2(a)(i)	28	25	19	32	18	22	3	12	20	7	5
2(a)(ii)											
2(b)											

3(a)									
3(b)(i)	Key: <table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Order of labelling</td> <td style="border: 1px solid black; width: 30px; height: 15px;"></td> <td style="border: 1px solid black; width: 30px; height: 15px;"></td> <td style="border: 1px solid black; padding: 2px;">← Label</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">Working values (do not cross out)</td> <td colspan="3" style="border: 1px solid black; height: 15px;"></td> </tr> </table> Length of shortest route from F to C via A:	Order of labelling			← Label	Working values (do not cross out)			
Order of labelling			← Label						
Working values (do not cross out)									
3(b)(ii)									

[illegible]

5(a)	
5(b)	
5(c)	
5(d)(i)	
5(d)(ii)	
5(e)(i)	<pre> graph LR S((S)) --> A((A)) S((S)) --> B((B)) S((S)) --> C((C)) S((S)) --> D((D)) S((S)) --> E((E)) A((A)) --> D((D)) B((B)) --> C((C)) B((B)) --> D((D)) B((B)) --> F((F)) C((C)) --> D((D)) C((C)) --> E((E)) C((C)) --> F((F)) D((D)) --> E((E)) E((E)) --> T((T)) F((F)) --> T((T)) </pre>
5(e)(ii)	

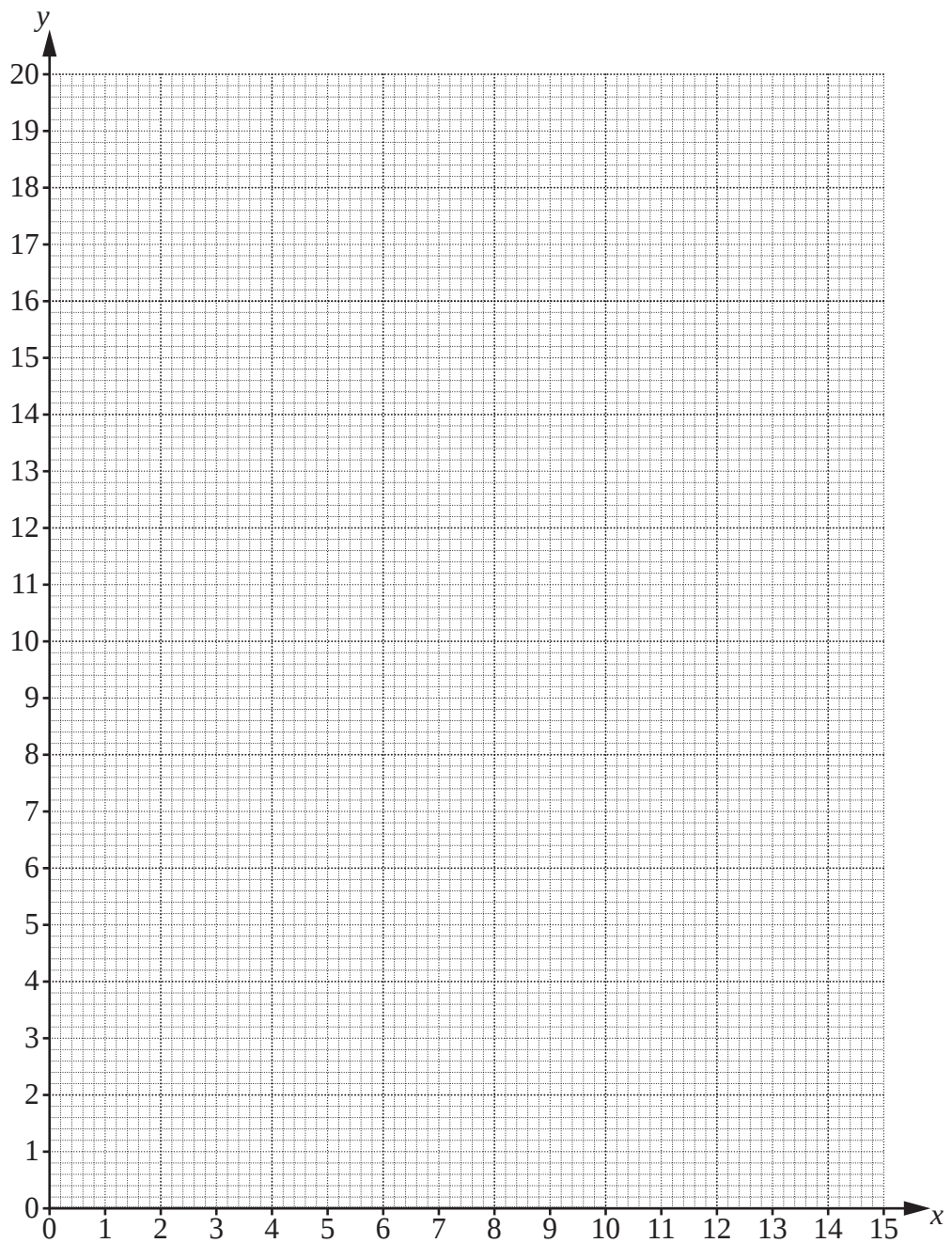
5(f)	
	5(g)(i)
5(g)(ii)	

6(a)																																										
6(b)																																										
6(c)																																										
	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>P</th> <th>x</th> <th>y</th> <th>s_1</th> <th>s_2</th> <th>s_3</th> <th>RHS</th> </tr> <tr> <td>1</td> <td>-26</td> <td>0</td> <td>0</td> <td>9</td> <td>0</td> <td>90</td> </tr> <tr> <td>0</td> <td>17</td> <td>0</td> <td>1</td> <td>-6</td> <td>0</td> <td>17</td> </tr> <tr> <td>0</td> <td>-2</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> <td>10</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>20</td> </tr> </table>							P	x	y	s_1	s_2	s_3	RHS	1	-26	0	0	9	0	90	0	17	0	1	-6	0	17	0	-2	1	0	1	0	10	0	1	0	0	1	1	20
	P	x	y	s_1	s_2	s_3	RHS																																			
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7(a)	<table><tr><th>Activity</th><th>Immediate Predecessor(s)</th></tr><tr><td>A</td><td></td></tr><tr><td>B</td><td></td></tr><tr><td>C</td><td></td></tr><tr><td>D</td><td></td></tr><tr><td>E</td><td></td></tr><tr><td>F</td><td></td></tr><tr><td>G</td><td></td></tr></table>	Activity	Immediate Predecessor(s)	A		B		C		D		E		F		G		<table><tr><th>Activity</th><th>Immediate Predecessor(s)</th></tr><tr><td>H</td><td></td></tr><tr><td>I</td><td></td></tr><tr><td>J</td><td></td></tr><tr><td>K</td><td></td></tr><tr><td>L</td><td></td></tr><tr><td>M</td><td></td></tr><tr><td>N</td><td></td></tr></table>	Activity	Immediate Predecessor(s)	H		I		J		K		L		M		N	
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7(b)(ii)																																		
7(c)																																		

7(d)



Duration of activity E:

H:

I:

