



Oxford Cambridge and RSA

Friday 24 May 2024 – 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)(i)	
1(a)(ii)	
1(b)	<div><div>A</div><div>B</div><div>C</div><div>D</div><div>E</div><div><div>A</div><div>B</div><div>C</div><div>D</div><div>E</div></div><div><div>A</div><div>B</div><div>C</div><div>D</div><div>E</div></div></div>
1(c)	
1(d)	

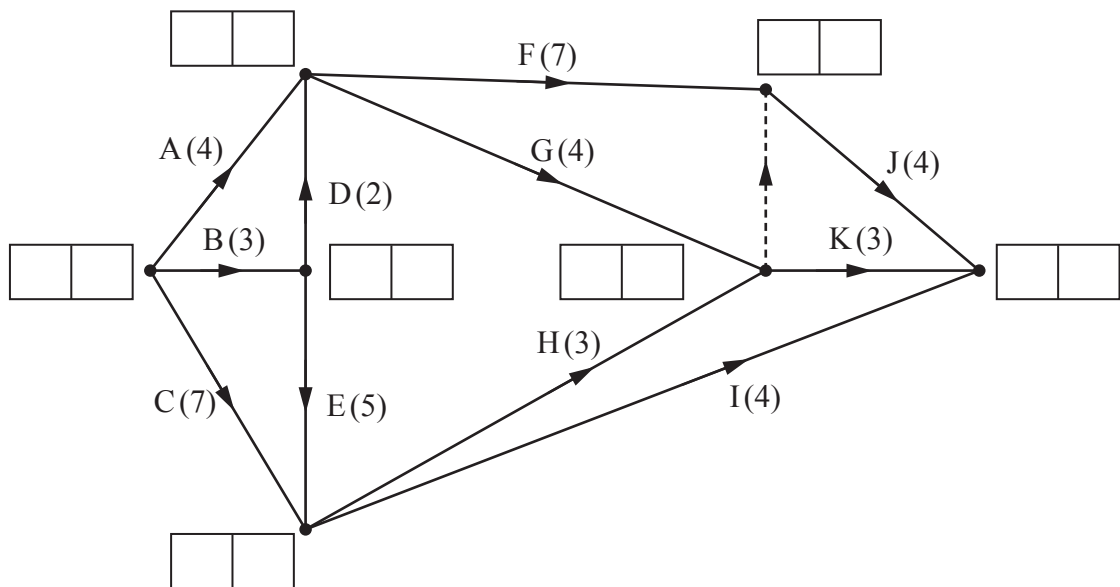
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2(a)	31	13	12	17	25	18	11	8	15
2(b)	31	13	12	17	25	18	11	8	15
2(c)									
2(d)									

3(a)

Activity	Immediate Predecessor(s)
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
K	

3(b)(i)



3(b)(ii)

3(b)(iii)

3(c)

3(d)

	0	1	2	3	4	5	6	7	8	9	10	11
Worker 1												
Worker 2												
Worker 3												

	11	12	13	14	15	16	17	18	19	20	21	22
Worker 1												
Worker 2												
Worker 3												

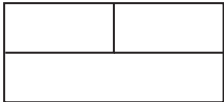
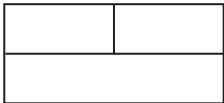
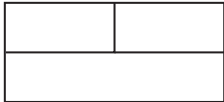
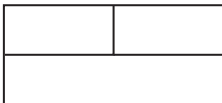
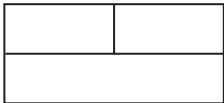
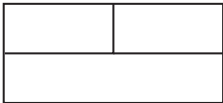
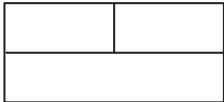
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4(a)	
4(b)	
4(c)	

P	x	y	z	s_1	s_2	s_3	RHS
1	-2	3	-1	0	0	0	0
0	1	2	3	1	0	0	k
0	3	-1	1	0	1	0	45
0	2	4	-1	0	0	1	50

P	x	y	z	s_1	s_2	s_3	RHS

4(d)

5(a)	
5(b)	
5(c) 5(d)(i)	<div style="display: flex; justify-content: space-around; align-items: flex-start; padding: 10px;"> <div style="text-align: center;">  <p>A •</p> </div> <div style="text-align: center;">  <p>B •</p> </div> <div style="text-align: center;">  <p>C •</p> </div> <div style="text-align: center;">  <p>D •</p> </div> <div style="text-align: center;">  <p>E •</p> </div> <div style="text-align: center;">  <p>F •</p> </div> <div style="text-align: center;">  <p>G •</p> </div> </div> <div style="margin-top: 20px;"> <p>Key:</p> <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="text-align: right; padding-right: 10px;">Order of labelling</div> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;"> <div style="display: flex; justify-content: space-between; align-items: center;"> → ← </div> <div style="border-top: 1px solid black; height: 15px; margin-top: 5px;"></div> </div> <div style="text-align: left; padding-left: 10px;">Label</div> </div> <div style="margin-top: 10px;"> <div style="display: flex; align-items: center;"> <div style="text-align: right; padding-right: 10px;">Working values (do not cross out)</div> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;"> <div style="border-top: 1px solid black; height: 15px; margin-top: 5px;"></div> </div> </div> </div> </div>
	Weight of shortest path from A to G:
5(d)(ii)	

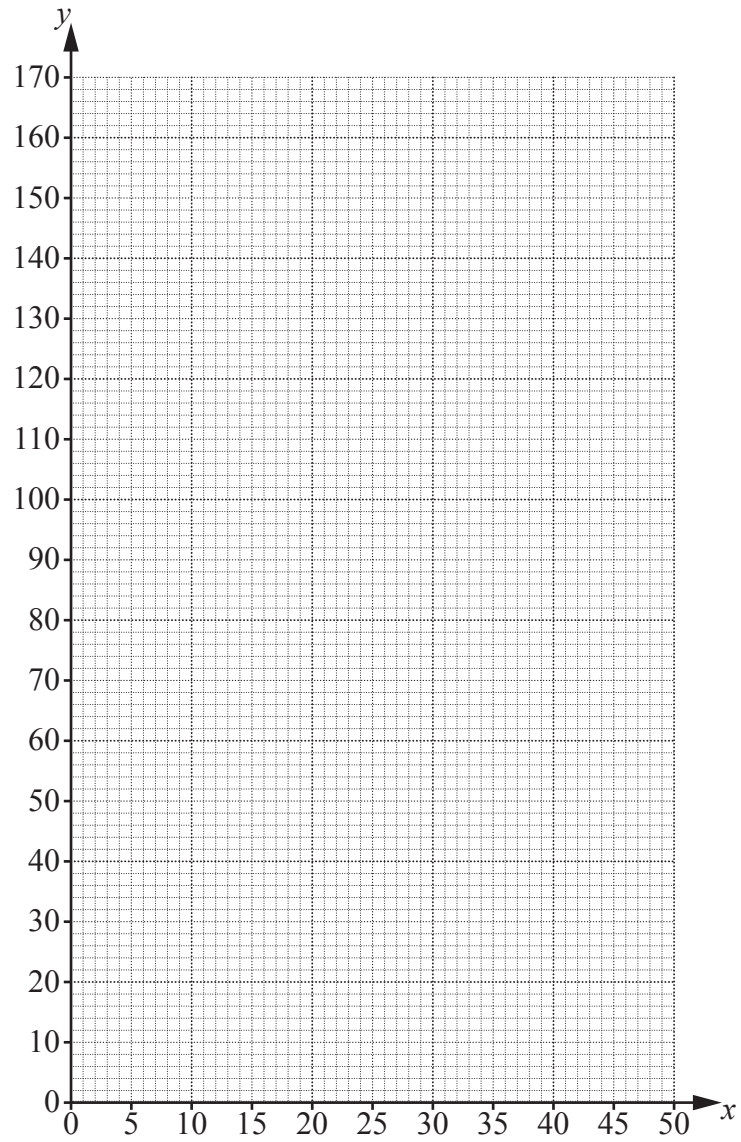
5(e)	
5(f)(i)	
5(f)(ii)	

DO NOT WRITE IN THIS SPACE

6(a)

(answer space continued on next page)

6(a) (continued)



6(b)

6(c)

[illegible]

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