



Oxford Cambridge and RSA

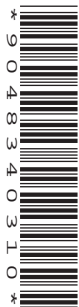
Wednesday 20 October 2021 – Afternoon

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 pages 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.

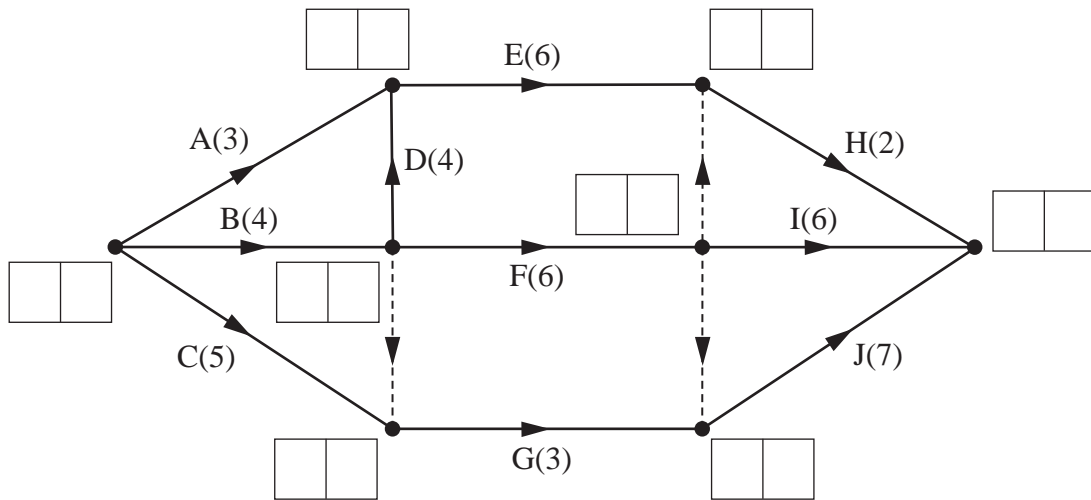
ADVICE

- Read each question carefully before you start your answer.

1(a)

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

1(b)(i)



1(b)(ii)

1(c)

2(a)	15	4	23	16	2	12	14	11	20	13	22
2(b)											
2(c)											
2(d)											
2(e)											

3(a)																																															
3(b)																																															
	<table border="1" style="width: 100%; border-collapse: collapse; margin: 0 auto;"> <thead> <tr> <th style="width: 10%;">P</th> <th style="width: 10%;">x</th> <th style="width: 10%;">y</th> <th style="width: 10%;">z</th> <th style="width: 10%;">s_1</th> <th style="width: 10%;">s_2</th> <th style="width: 10%;">s_3</th> <th style="width: 10%;">RHS</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">-10</td> <td style="text-align: center;">3</td> <td style="text-align: center;">7</td> <td style="text-align: center;">0</td> <td style="text-align: center;">485</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">-3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">0</td> <td style="text-align: center;">145</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">-5</td> <td style="text-align: center;">1</td> <td style="text-align: center;">3</td> <td style="text-align: center;">0</td> <td style="text-align: center;">195</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">75</td> </tr> </tbody> </table>							P	x	y	z	s_1	s_2	s_3	RHS	1	0	0	-10	3	7	0	485	0	0	1	-3	1	2	0	145	0	1	0	-5	1	3	0	195	0	0	0	1	0	1	1	75
P	x	y	z	s_1	s_2	s_3	RHS																																								
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3(c)																																															
3(d)(i)	$x =$																																														
	$y =$																																														
	$z =$																																														
3(d)(ii)																																															

4(a)

<i>a</i>	<i>b</i>	<i>n</i>	<i>h</i>	<i>c</i>	<i>d</i>	<i>e</i>

4(b)**4(c)****4(d)**

5(a)

5(b)

5(c)(i)

Key:

		←	Label
		→	
		→	

B

E

A

C

G

D

F

Length of shortest path from A to G:

5(c)(ii) Shortest path from A to G:

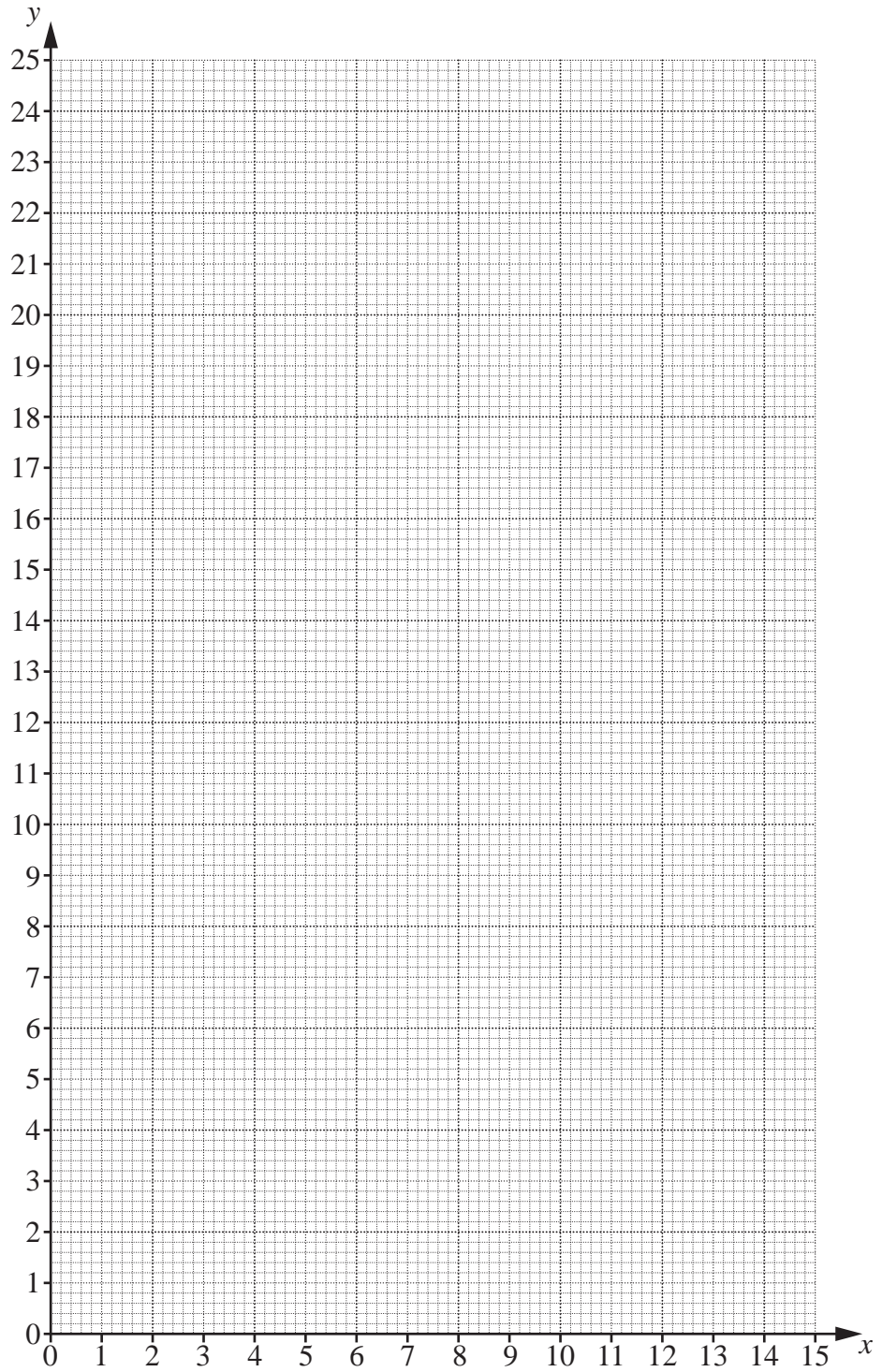
5(d)	
5(e)	
5(f)	

6(a)

6(b)

<i>Q</i>	<i>P</i>	<i>x</i>	<i>y</i>	<i>z</i>	<i>s</i> ₁	<i>s</i> ₂	<i>s</i> ₃	<i>s</i> ₄	<i>s</i> ₅	<i>a</i> ₁	<i>a</i> ₂	RHS

6(c) continued



$P =$
$x =$
$y =$
$z =$

