

Wednesday 8 June 2022 – Afternoon

A Level Further Mathematics B (MEI)

Y433/01 Modelling with Algorithms

Printed Answer Booklet

Time allowed: 1 hour 15 minutes

9
6
4
5
2
9
2
1
7
8
2
2
*

You must have:

- Question Paper Y433/01 (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.

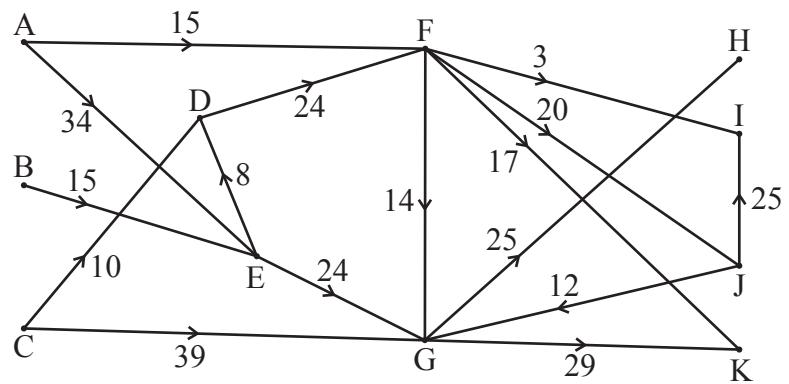
INFORMATION

- This document has **20** pages.

ADVICE

- Read each question carefully before you start your answer.

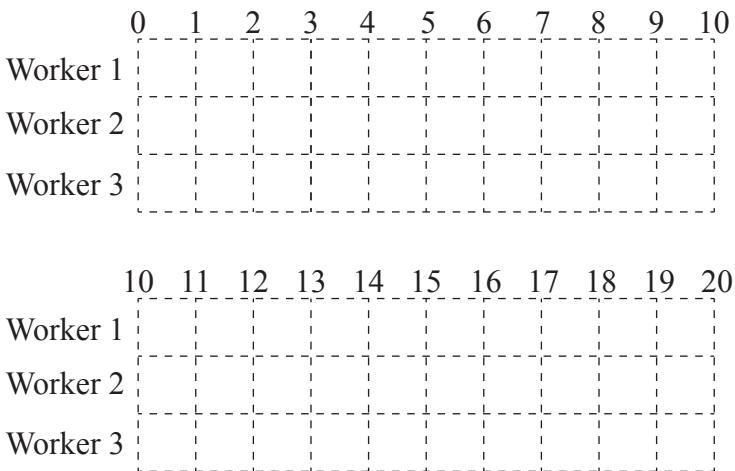
1(a)



1(b)

1(c)

1(d)	
1(e)	

3(a)																									
3(b)	<table border="1" data-bbox="589 413 1117 1140"> <thead> <tr> <th data-bbox="589 413 747 467">Activity</th><th data-bbox="747 413 1117 467">Duration (hours)</th></tr> </thead> <tbody> <tr><td data-bbox="589 467 747 521">A</td><td data-bbox="747 467 1117 521"></td></tr> <tr><td data-bbox="589 521 747 574">B</td><td data-bbox="747 521 1117 574"></td></tr> <tr><td data-bbox="589 574 747 628">C</td><td data-bbox="747 574 1117 628"></td></tr> <tr><td data-bbox="589 628 747 682">D</td><td data-bbox="747 628 1117 682"></td></tr> <tr><td data-bbox="589 682 747 736">E</td><td data-bbox="747 682 1117 736"></td></tr> <tr><td data-bbox="589 736 747 790">F</td><td data-bbox="747 736 1117 790"></td></tr> <tr><td data-bbox="589 790 747 844">G</td><td data-bbox="747 790 1117 844"></td></tr> <tr><td data-bbox="589 844 747 898">H</td><td data-bbox="747 844 1117 898"></td></tr> <tr><td data-bbox="589 898 747 952">I</td><td data-bbox="747 898 1117 952"></td></tr> <tr><td data-bbox="589 952 747 1006">J</td><td data-bbox="747 952 1117 1006"></td></tr> <tr><td data-bbox="589 1006 747 1060">K</td><td data-bbox="747 1006 1117 1060"></td></tr> </tbody> </table>	Activity	Duration (hours)	A		B		C		D		E		F		G		H		I		J		K	
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3(c)	 <p>There is a spare copy of this schedule on page 16</p>																								

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

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PLEASE DO NOT WRITE ON THIS PAGE

5(a)																																		
5(b)																																		
5(c)																																		
<table border="1"> <thead> <tr> <th>Q</th> <th>X</th> <th>Y</th> <th>Z</th> <th>s_1</th> <th>s_2</th> <th>RHS</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							Q	X	Y	Z	s_1	s_2	RHS																					
Q	X	Y	Z	s_1	s_2	RHS																												

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5(d)

Q	X	Y	Z	s_1	s_2	RHS
1	$\frac{7}{4}$	0	-1	0	$\frac{3}{4}$	24
0	$\frac{7}{4}$	0	4	1	$-\frac{1}{4}$	40
0	$\frac{5}{4}$	1	0	0	$\frac{1}{4}$	8

Q	X	Y	Z	s_1	s_2	RHS

There is a spare copy of this tableau on page 16

5(e)

$P =$

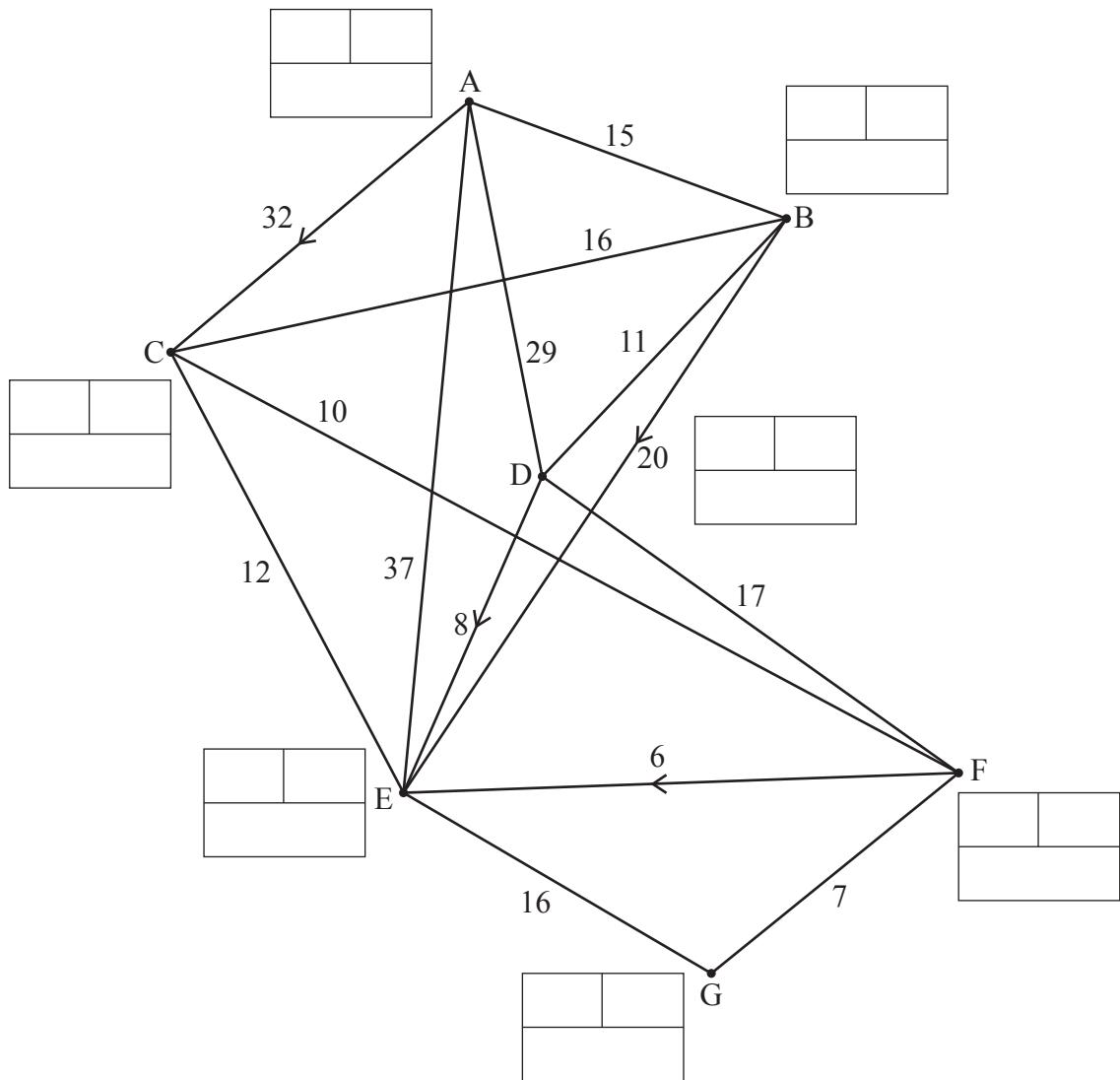
$x =$

$y =$

$z =$

6(a)

Key:
 Order of labelling →
 Working values
 (do not cross out) →
 Label



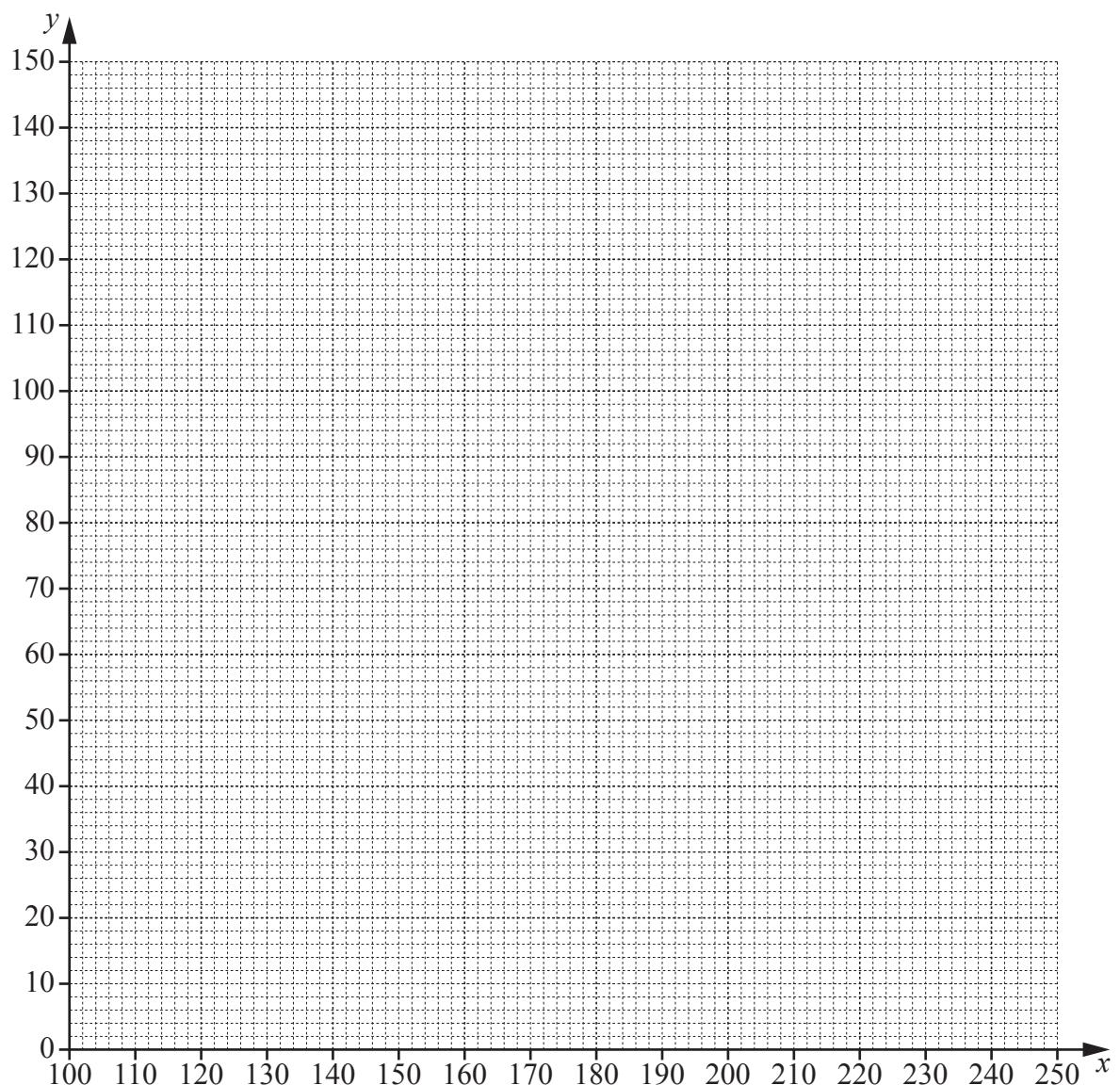
Shortest path from A to G:

6(b)(i)	
6(b)(ii)	
6(b)(iii)	
6(c)(i)	
6(c)(ii)	

7(a)	
7(b)	

7(b) (continued)

7(c)



There is a spare copy of this graph on page 17

(answer space continued on the next page)

3(c)

Spare copy of schedule for Q3(c)

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

	10	11	12	13	14	15	16	17	18	19	20
Worker 1											
Worker 2											
Worker 3											

5(c)

Spare copy of tableau for Q5(c)

Q	X	Y	Z	s_1	s_2	RHS

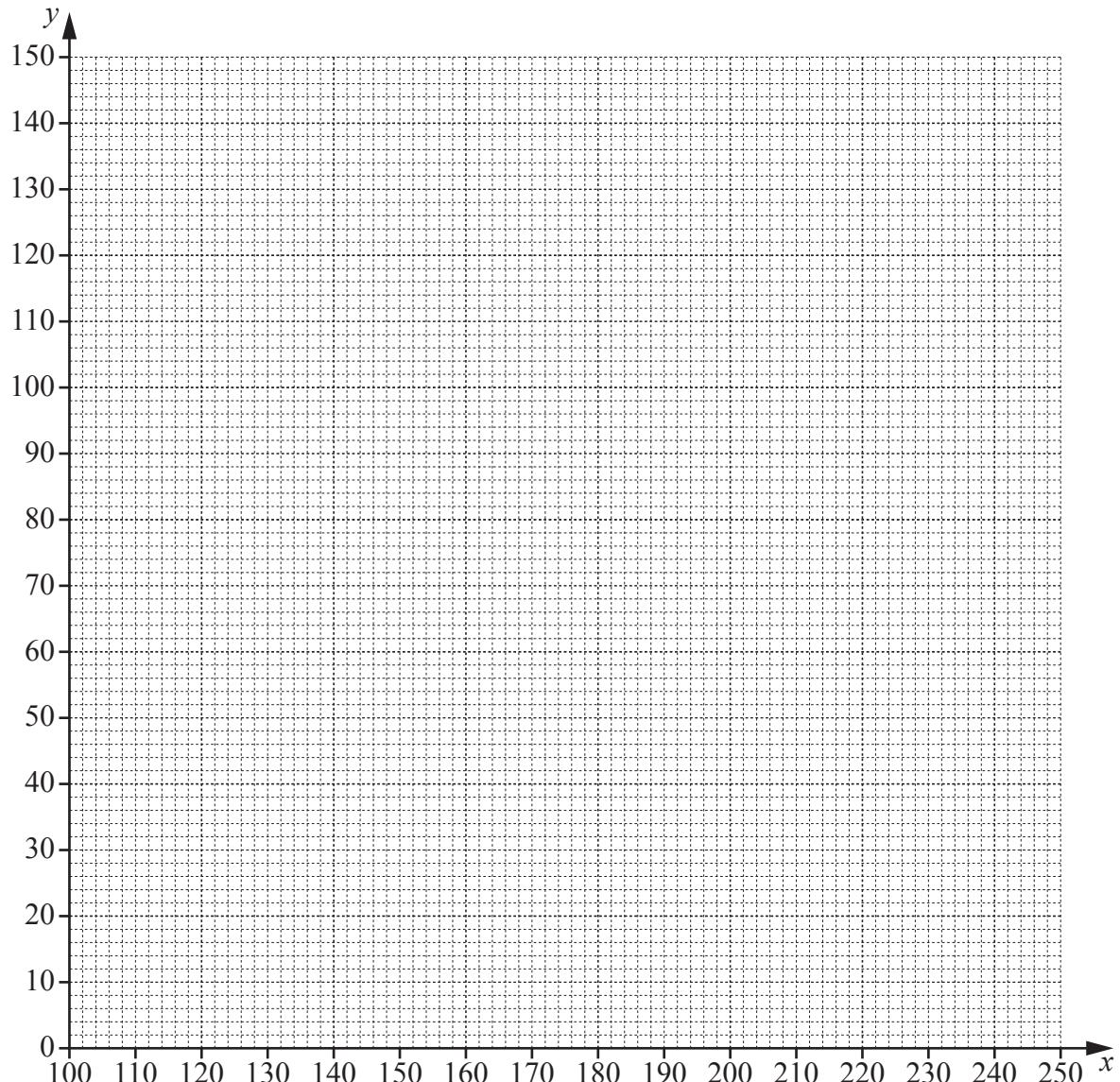
5(d)

Spare copy of tableau for Q5(d)

Q	X	Y	Z	s_1	s_2	RHS

7(c)

Spare copy of graph for Q7(c)



ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).



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