OCR
Oxford Cambridge and RSA

Wednesday 20 October 2021 – Afternoon

A Level Further Mathematics B (MEI)

Y433/01 Modelling with Algorithms

Printed Answer Booklet

Time allowed: 1 hour 15 minutes

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You must have:
- Question Paper Y433/01 (inside this document)
- the Formulae Booklet for Further Mathematics B (MEI)
- a scientific or graphical calculator

Y43301

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

Centre number | | | | | | Candidate number | | | | |

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.

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1(a)	
1(b)	
	The answer space for Q2(a) and Q2(b) is on page 3
2(c)	
2(d)	

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2(a)(b)	
2(e)	

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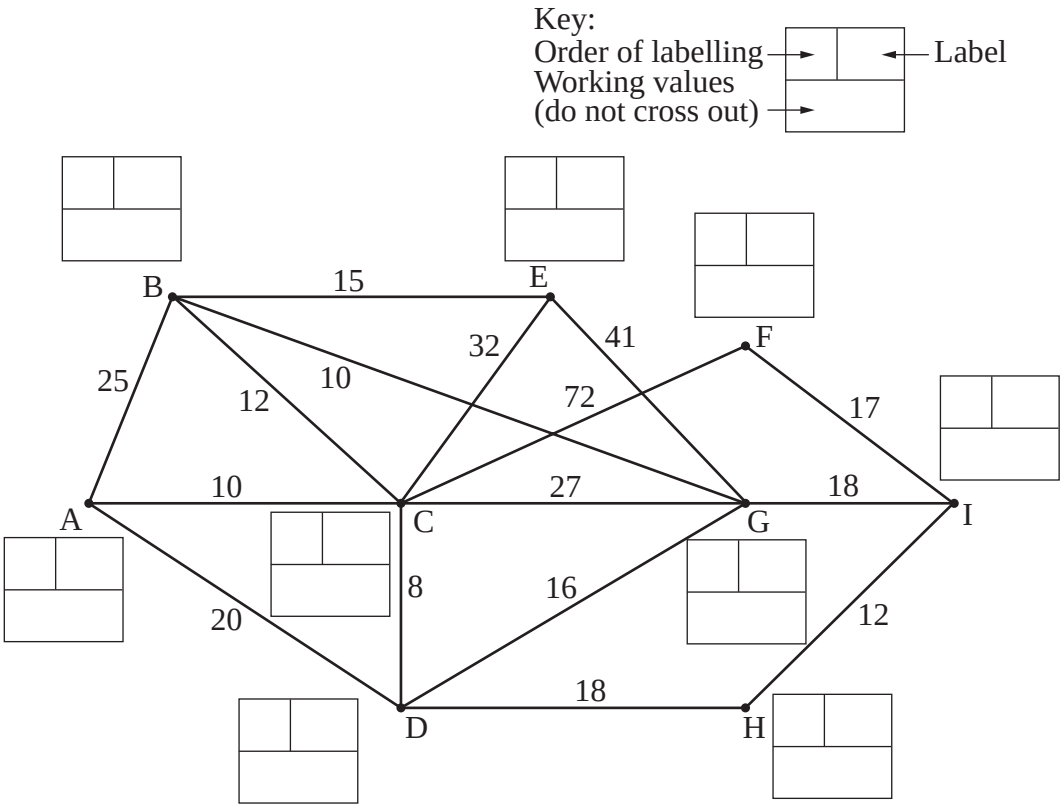
3(a)(i)

3(a)(ii)

3(b)



Shortest path from A to F:

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3(c) STEP 1:

Possible pairings of odd nodes	Corresponding shortest path	Length of shortest path

3(d) STEP 2:

STEP 3:

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4(a)(i)	Cut $\alpha =$
4(a)(ii)	Cut $\beta =$
4(b)	The maximum possible flow is
4(c)	
4(d)	
	Subject to
	$SA - AB - AD = 0$ $SC - CB - CF = 0$ $AD + BD - DE - DT = 0$ $BF + CF - FG = 0$ $BG + EG + FG - GT = 0$
	$SA \leqslant 62$, $SB \leqslant 71$, $SC \leqslant 47$, $AB \leqslant 43$, $AD \leqslant 22$, $BD \leqslant 39$, $BE \leqslant 32$, $BF \leqslant 43$, $BG \leqslant 47$, $CB \leqslant 25$, $CF \leqslant 39$, $DE \leqslant 33$, $EG \leqslant 43$, $FG \leqslant 42$

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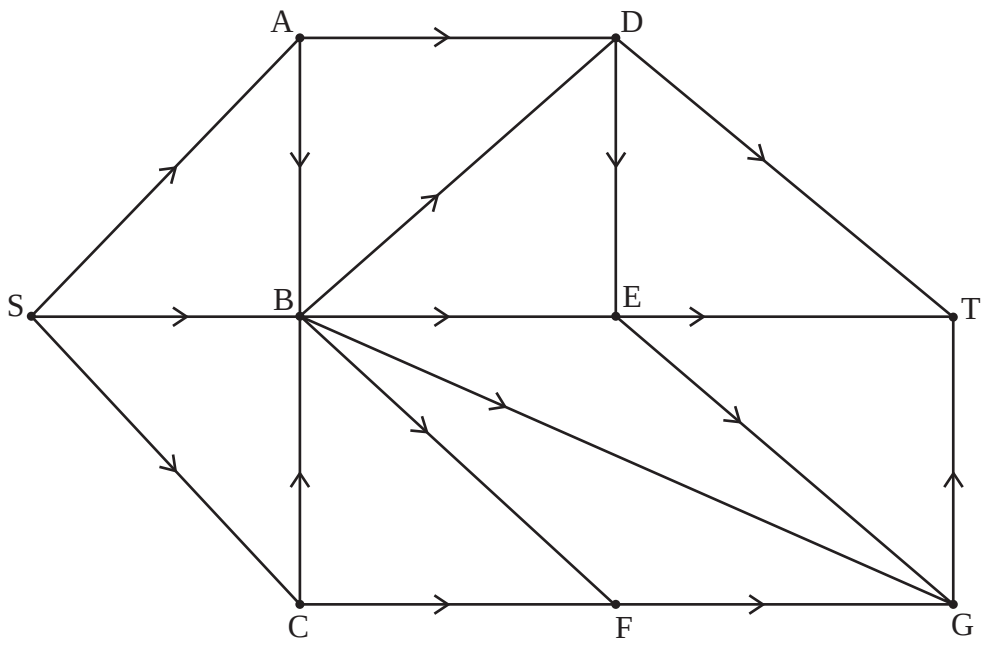
4(e)



4(f)

4(g)

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5(a)

Q	P	x	y	z	s_1	s_2	s_3	s_4	s_5	a_1	RHS

There is a spare copy of this tableau on page 11

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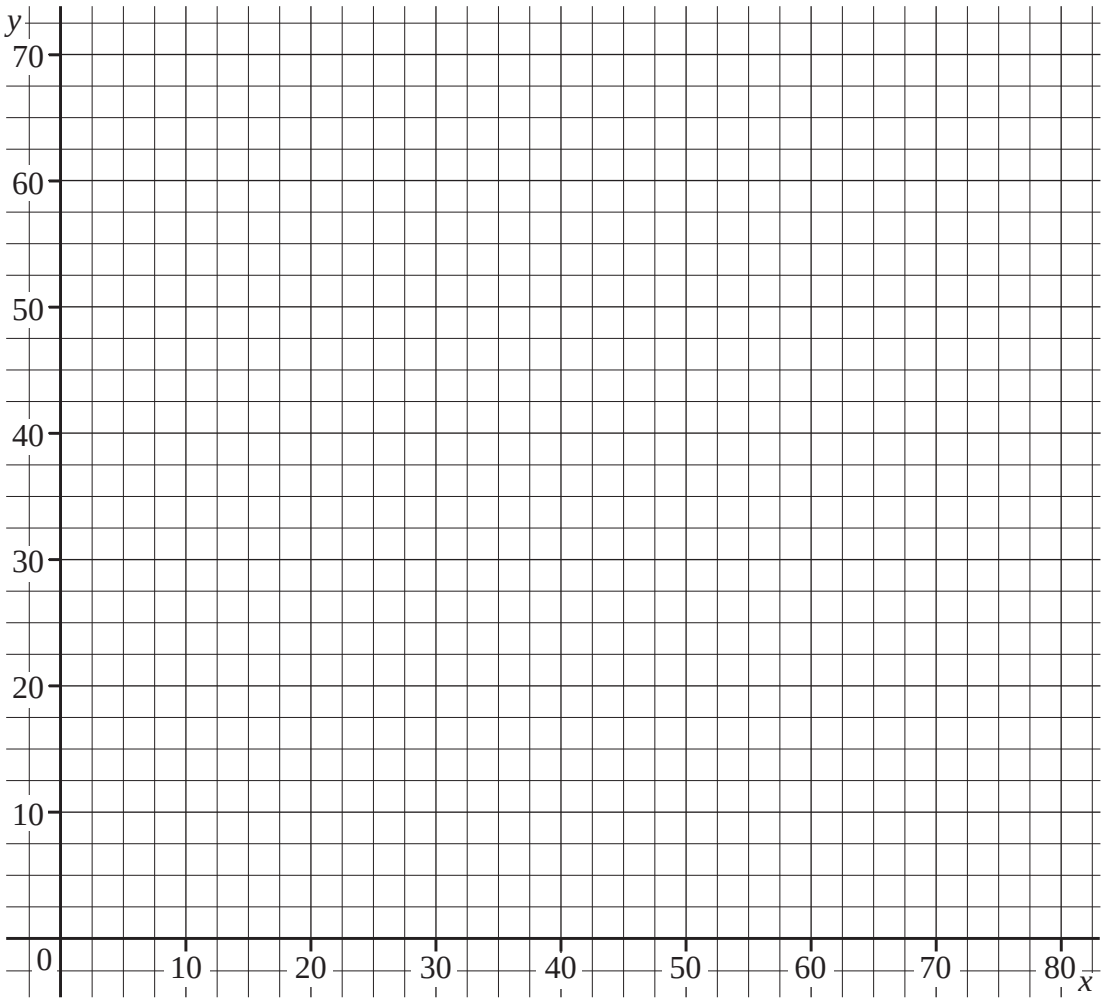
5(b)



There is a spare copy of this graph on page 11

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5(c)	
5(d)(i)	
5(d)(ii)	
5(e)	

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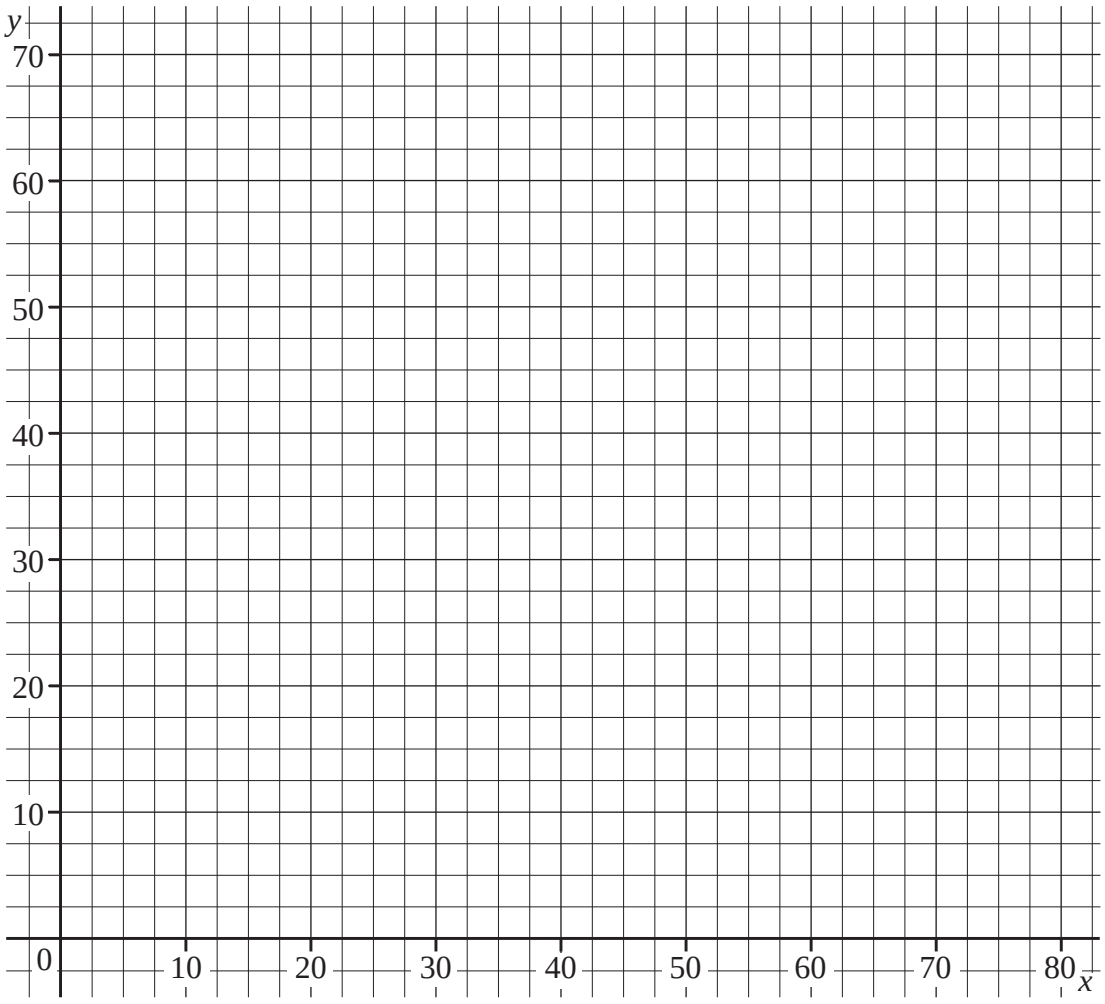
5(a) Spare copy of tableau for Q5(a)

Q	P	x	y	z	s_1	s_2	s_3	s_4	s_5	a_1	RHS

5(b) Spare copy of graph for Q5(b)



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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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