



# Wednesday 13 June 2018 - Morning

# AS GCE MATHEMATICS

4736/01 Decision Mathematics 1

### **PRINTED ANSWER BOOK**

Candidates answer on this Printed Answer Book.

#### **OCR** supplied materials:

- Question Paper 4736/01 (inserted)
- List of Formulae (MF1)

#### Other materials required:

· Scientific or graphical calculator

**Duration:** 1 hour 30 minutes



Candidate forename				Candidate surname			
Centre numb	er			Candidate nu	ımber		

### **INSTRUCTIONS TO CANDIDATES**

These instructions are the same on the Printed Answer Book and the Question Paper.

- The Question Paper will be found inside the Printed Answer Book.
- Write your name, centre number and candidate number in the spaces provided on the Printed Answer Book. Please write clearly and in capital letters.
- Write your answer to each question in the space provided in the Printed Answer Book. If additional space is required, you should use the lined page(s) at the end of the Printed Answer Book. The question number(s) must be clearly shown.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer all the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Do not write in the barcodes.
- You are permitted to use a scientific or graphical calculator in this paper.
- Give non-exact numerical answers correct to 3 significant figures unless a different degree of accuracy is specified in the question or is clearly appropriate.

#### INFORMATION FOR CANDIDATES

This information is the same on the Printed Answer Book and the Question Paper.

- The number of marks is given in brackets [ ] at the end of each question or part question on the Question Paper.
- You are reminded of the need for clear presentation in your answers.
- The total number of marks for this paper is 72.
- The Printed Answer Book consists of 12 pages. The Question Paper consists of 8 pages.
   Any blank pages are indicated.

1 (i)									
	Shop	A	В	С	D	Е	F	G	Н
	Boxes	500	400	600	300	300	400	300	200
	Van 1:								
	Van 2:								
	Van 3:								
	Van 4:								
1 (ii)									
	Shop	A	В	С	D	Е	F	G	Н
	Boxes	500	400	600	300	300	400	300	200
	Van 1:								
	Van 2:								
	Van 3:								
	Van 4:								
l (iii)									
	Shop	A	В	С	D	Е	F	G	Н
	Boxes	500	400	600	300	300	400	300	200
		1			1				
	Van 1:								
	Van 2:								
	Van 3:								
(iv)									

2 (i)			
	M	N	P
2 (;;)			
2 (ii)			
2 (11)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N	P
2 (II)	M	N N	P

3 (i)							
3 (ii)							
3 (iii)							
	P	x	у	S	t	и	RHS
	1	-2	4	0	0	0	0
	0	4	-12	1	0	0	12
	0	7	-19	0	1	0	35
	0	-3	15	0	0	1	0
	A spare copy	of this diagra	m can be four	nd on page 5.			
	P	x	у	S	t	и	RHS
							_
					(answer spa	ice continued	l on next page)

3 (iii)	(continued)						
	Spare copy of	the diagram	for question 3(	iii).			
	P	x	у	S	t	и	RHS
3 (iv)							
	<i>P</i> =		c =	y	· =		
	<i>s</i> =	t	· =	u	ı =		
3 (v)							
-							
-							
-							
-							
-							

### A (ii)  ### A (iii)  #### A (iii)  #### A (iii)  #### A (iii)  ##### A (iii)  #################################								4 (i)
M       N       P       R       S         M       6       7         N       5       4         P       6       3       2         R       5       3       4         S       7       4       2       4     Arcs used (in order of being chosen)  Total weight  **N  **N  **N  **N  **N  **N  **N  *								
M       6       7         N       5       4         P       6       3       2         R       5       3       4         S       7       4       2       4    Arcs used (in order of being chosen) Total weight M • N S • • P		S	R	P	N	M		4 (ii)
N       5       4         P       6       3       2         R       5       3       4         S       7       4       2       4         Arcs used (in order of being chosen)       Tree       Total weight         M       • N			T.		11	171		
P       6       3       2         R       5       3       4         S       7       4       2       4         Ares used (in order of being chosen)         Tree       Total weight         M •       • N				6				
R       5       3       4         S       7       4       2       4         Arcs used (in order of being chosen)		4	5				N	
Arcs used (in order of being chosen)  Tree  Total weight $M \bullet \bullet N$ $\bullet P$		2	3			6	P	
Arcs used (in order of being chosen)  Tree  Total weight  N  P		4		3	5		R	
Tree Total weight $M \bullet \qquad \bullet N$ $S \bullet \qquad \bullet P$			4	2	4	7	S	
Tree Total weight $M \bullet \qquad \bullet N$ $S \bullet \qquad \bullet P$ $R$					I.	I		
$M \bullet \qquad \bullet N$ $S \bullet \qquad \bullet P$ $R$				chosen)	ler of being	used (in ord	Arcs u	
$M \bullet \qquad \bullet N$ $S \bullet \qquad \bullet P$ $R$	 							
$M \bullet \qquad \bullet N$ $S \bullet \qquad \bullet P$ $R$	 							
$M \bullet \qquad \bullet N$ $S \bullet \qquad \bullet P$	weight	1					Tree	
$S \bullet \qquad \bullet P$ $R$	 			• <i>N</i>		$M \bullet$		
• R				• IV		WI ♥		
• R								
• R			• <i>P</i>				S •	
(iii) $x =$					$\stackrel{ullet}{R}$			
(iii) x =								
(iii) x =								
$x = \frac{1}{2} \left( \frac{1}{2} \right)^{2} $								
							<i>x</i> =	(iii)
(iv) $x =$							x =	(iv)

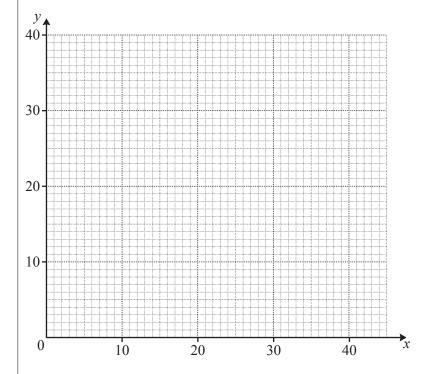
4 (v)			
4 (vi)			
4 (~;;)	Upper bound =		
4 (vii)			
	M ullet	• N	
	U ullet	• <i>P</i>	
		• 1	
	<i>S</i> •	• <i>R</i>	
4 (viii)			
4 (VIII)			
	M ullet	• <i>N</i>	
	U ullet	• <i>P</i>	
	S $ullet$	• <i>R</i>	

5 (i) $ 3x $	$+4v \le 120$	because
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Other constraints (apart from *x* and *y* being integers)

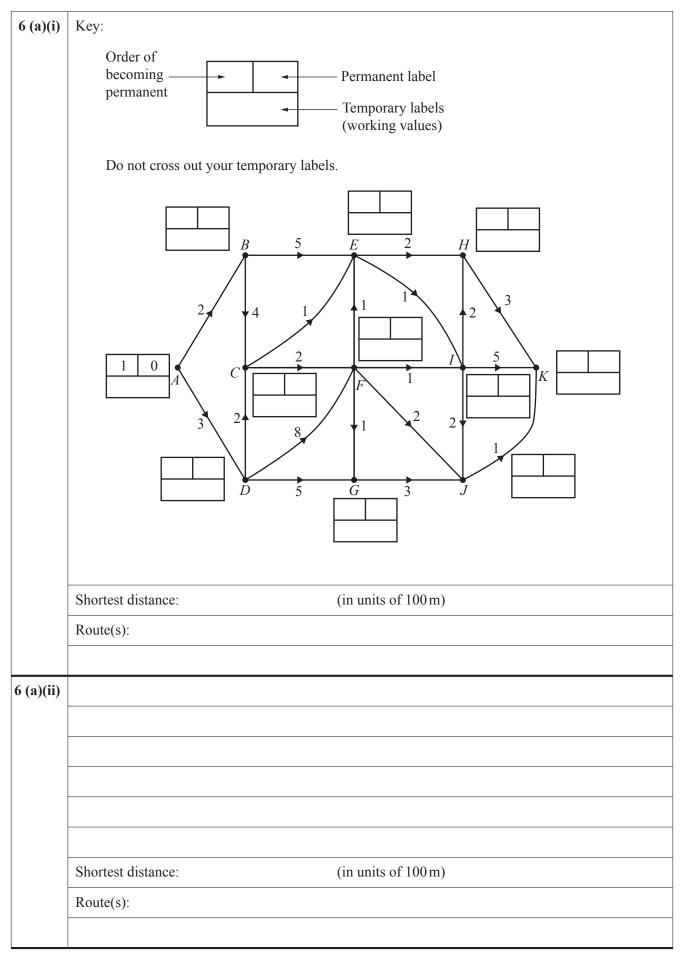
5 (ii) P=

# 5 (iii) A spare copy of this diagram can be found on page 9.



(answer space continued on next page)

5 (iii)	(continued)
	Spare copy of the diagram for question 5(iii).
	40
	30-
	20-
	10-
	0 10 20 30 40 x
5 (iv)	
, ,	
	Small jars Large jars
5 (v)	
,	Profit £



6 (b)(i)		
	Minimum distance =	(in units of 100 m)
	Arcs that represent repeated roads:	
6 (b)(ii)		
	Minimum distance =	(in units of 100 m)
	Number of times through $F =$	

## 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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