

OCR

Oxford Cambridge and RSA

Friday 5 June 2015 – Morning

AS GCE MATHEMATICS

4736/01 Decision Mathematics 1

PRINTED ANSWER BOOK

Candidates answer on the 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	
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Centre number						Candidate number				
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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.** Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- 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 bar codes.
- 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 **16** pages. The Question Paper consists of **12** pages. Any blank pages are indicated.

1 (i)	15	7	9	26	10	4
	List at end of first pass:					
	Comparisons =			Swaps =		
1 (ii)	7	9	4	10	15	26
	List at end of fourth pass:					
	Comparisons =			Swaps =		
1 (iii)						

1 (iv)	15	7	9	26	10	4
	List at end of first pass:					
	Comparisons =			Swaps =		
1 (v)	7	9	15	26	10	4
	List at end of fourth pass:					
	Comparisons =			Swaps =		
1 (vi)						
	Comparisons =			Swaps =		
1 (vii)						

2 (i)

2 (ii)

$$BD = 5$$

$$FG = 5$$

$$DE = 6$$

$$DF = 7$$

$$EH = 7$$

$$BC = 8$$

$$DG = 8$$

$$GH = 8$$

$$AD = 9$$

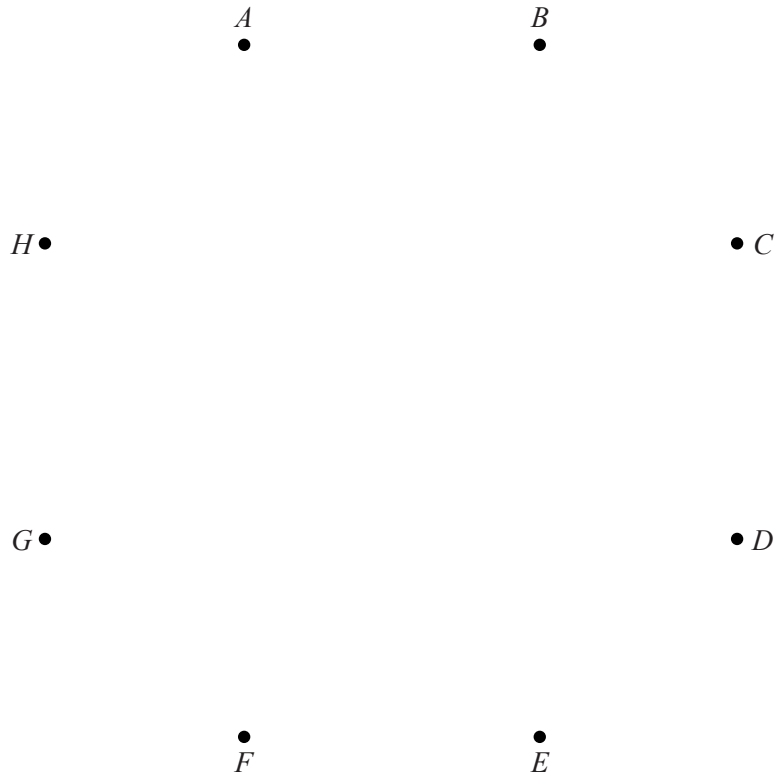
$$CD = 9$$

$$EG = 9$$

$$AB = 10$$

$$AE = 10$$

$$CF = 10$$



2 (iii)																																																																																	
2 (iv)																																																																																	
<table border="1" style="border-collapse: collapse; text-align: center;"><thead><tr><th></th><th><i>A</i></th><th><i>B</i></th><th><i>C</i></th><th><i>D</i></th><th><i>E</i></th><th><i>F</i></th><th><i>G</i></th><th><i>H</i></th></tr></thead><tbody><tr><th><i>A</i></th><td>–</td><td>10</td><td>–</td><td>9</td><td>10</td><td>–</td><td>–</td><td>–</td></tr><tr><th><i>B</i></th><td>10</td><td>–</td><td>8</td><td>5</td><td>–</td><td>–</td><td>–</td><td>–</td></tr><tr><th><i>C</i></th><td>–</td><td>8</td><td>–</td><td>9</td><td>–</td><td>10</td><td>–</td><td>–</td></tr><tr><th><i>D</i></th><td>9</td><td>5</td><td>9</td><td>–</td><td>6</td><td>7</td><td>8</td><td>–</td></tr><tr><th><i>E</i></th><td>10</td><td>–</td><td>–</td><td>6</td><td>–</td><td>–</td><td>9</td><td>7</td></tr><tr><th><i>F</i></th><td>–</td><td>–</td><td>10</td><td>7</td><td>–</td><td>–</td><td>5</td><td>–</td></tr><tr><th><i>G</i></th><td>–</td><td>–</td><td>–</td><td>8</td><td>9</td><td>5</td><td>–</td><td>8</td></tr><tr><th><i>H</i></th><td>–</td><td>–</td><td>–</td><td>–</td><td>7</td><td>–</td><td>8</td><td>–</td></tr></tbody></table>		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>A</i>	–	10	–	9	10	–	–	–	<i>B</i>	10	–	8	5	–	–	–	–	<i>C</i>	–	8	–	9	–	10	–	–	<i>D</i>	9	5	9	–	6	7	8	–	<i>E</i>	10	–	–	6	–	–	9	7	<i>F</i>	–	–	10	7	–	–	5	–	<i>G</i>	–	–	–	8	9	5	–	8	<i>H</i>	–	–	–	–	7	–	8	–
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3 (i)	
3 (ii)	
3 (iii)	

3 (iv)	

DO NOT WRITE IN THIS SPACE

4 (i)																																																																			
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4 (iii)	<p>Initial tableau</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <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</th> <th style="width: 10%;">t</th> <th style="width: 10%;">u</th> <th style="width: 10%;">v</th> <th style="width: 10%;">RHS</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>row 1</td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>row 2</td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>row 3</td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>row 4</td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>row 5</td><td></td> </tr> </tbody> </table> <p style="margin-top: 10px;">space for working</p> <div style="border: 1px solid black; height: 100px; margin-top: 5px;"></div> <p style="text-align: right; margin-top: 10px;">(answer space continues on next page)</p>	P	x	y	z	s	t	u	v	RHS												row 1											row 2											row 3											row 4											row 5	
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4 (iii)	(continued)										
After one iteration											
	<i>P</i>	<i>x</i>	<i>y</i>	<i>z</i>	<i>s</i>	<i>t</i>	<i>u</i>	<i>v</i>	RHS		
										row 1'	
										row 2'	
										row 3'	
										row 4'	
										row 5'	
4 (iv)											

5 (i)

Do not cross out your temporary labels

Key:

- Permanent label
- Temporary labels
- Order of becoming permanent

Network diagram details:

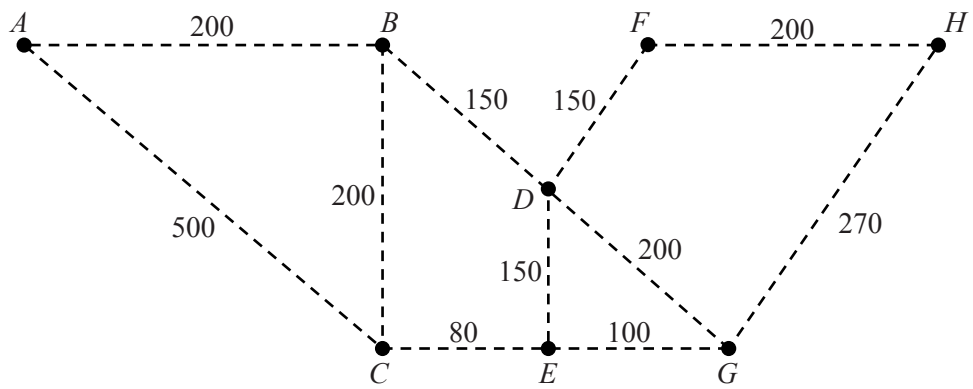
- Nodes: A, B, C, D, E, F, G, H
- Edges and weights:
 - A-B: 200
 - A-C: 500
 - B-D: 150
 - B-C: 200
 - C-E: 80
 - C-G: 200
 - D-E: 150
 - D-F: 150
 - D-G: 200
 - E-G: 100
 - F-H: 200
 - G-H: 270
- Labeling boxes:
 - Nodes A, B, F, H: Each has a box with a permanent label (top right) and temporary labels (bottom right).
 - Nodes C, E, G: Each has a box with temporary labels (bottom right).
 - Node D: Has a box with temporary labels (bottom right).

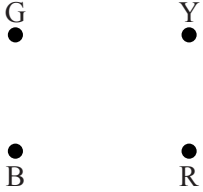
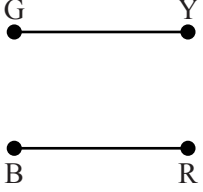
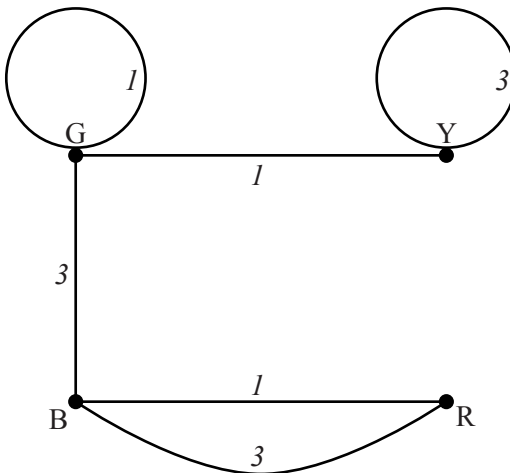
5 (ii)

5 (iii)

5 (iv)

5 (v)



6 (i)	<p>Cube 2</p> 
6 (ii)	<p> </p>
6 (iii)	<p>Cube 4</p> 
6 (iv)	

6 (v)	

6 (vi)	<p style="margin: 0;"> G Y ● ● ● ● B R <i>I</i> </p>
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6 (vii)	Front of tower	Back of tower	Front of tower	Back of tower															
	<table border="1" style="width: 100%; height: 100%;"> <tr><td style="text-align: center; padding: 10px;">B</td></tr> <tr><td style="text-align: center; padding: 10px;">R</td></tr> <tr><td style="text-align: center; padding: 10px;">Y</td></tr> <tr><td style="text-align: center; padding: 10px;">G</td></tr> </table>	B	R	Y	G	<table border="1" style="width: 100%; height: 100%;"> <tr><td style="height: 40px;"></td></tr> <tr><td style="height: 40px;"></td></tr> <tr><td style="height: 40px;"></td></tr> <tr><td style="height: 40px;"></td></tr> </table>					<table border="1" style="width: 100%; height: 100%;"> <tr><td style="text-align: center; padding: 10px;">B</td></tr> <tr><td style="text-align: center; padding: 10px;">R</td></tr> <tr><td style="text-align: center; padding: 10px;">Y</td></tr> <tr><td style="text-align: center; padding: 10px;">G</td></tr> </table>	B	R	Y	G	<table border="1" style="width: 100%; height: 100%;"> <tr><td style="height: 40px;"></td></tr> <tr><td style="height: 40px;"></td></tr> <tr><td style="height: 40px;"></td></tr> <tr><td style="height: 40px;"></td></tr> </table>			
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