



Oxford Cambridge and RSA

**Thursday 16 May 2019 – Afternoon**

**AS Level Further Mathematics A**

**Y534/01 Discrete Mathematics**

**PRINTED ANSWER BOOKLET**

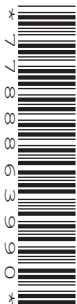
**Time allowed: 1 hour 15 minutes**

**You must have:**

- Question Paper Y534/01 (inserted)
- Formulae AS Further Mathematics A

**You may use:**

- 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)

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Last name

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**INSTRUCTIONS**

- The Question Paper will be found inside the Printed Answer Booklet.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- **Write your answer to each question in the space provided in the Printed Answer Booklet.** If additional space is required, use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- 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.
- The acceleration due to gravity is denoted by  $g \text{ m s}^{-2}$ . Unless otherwise instructed, when a numerical value is needed, use  $g = 9.8$ .

**INFORMATION**

- **You are reminded of the need for clear presentation in your answers.**
- The Printed Answer Booklet consists of **12** pages. The Question Paper consists of **8** pages.

<b>1(a)</b>	
<b>1(b)</b>	
<b>1(c)</b>	
<b>1(d)</b>	

**2(a)**

Vertex	J	K	L	M	N
Degree					

Vertex	P	Q	R	S	T
Degree					

**2(b)**


**2(c)(i)**


**2(c)(ii)**


**2(d)**


<b>3(a)</b>																																																																																																	
<b>3(b)</b>	6      9      5      7      6      4																																																																																																
	<table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 45%; text-align: center;">Input list</th> <th style="width: 5%; text-align: center;"><i>L</i></th> <th style="width: 5%; text-align: center;"><i>N</i></th> <th style="width: 45%; text-align: center;">Output list</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Input list	<i>L</i>	<i>N</i>	Output list																																																																																												
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<b>3(b)</b>	<b>(continued)</b> Continuation of table if needed			
	Input list	<i>L</i>	<i>N</i>	Output list
<b>3(c)(i)</b>				
<b>3(c)(ii)</b>				
<b>3(d)</b>				

**4(a)**

**(answer space continued on next page)**

<b>4(a)</b>	<b>(continued)</b>
	Space for working:
<b>Longest path(s):</b>	
<b>Shortest path(s):</b>	
<b>4(b)</b>	
<b>4(c)</b>	

**5(a)****5(b)(i)**

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<b>5(b)(i)</b>	<b>(continued)</b>																																																																																																																																																										
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**6(a)**

Emma

	X	Y	Z
P			
Q			
R			

Drew

**6(b)**

(answer space continued on next page)

6(b) (continued)



6(c)