

## Friday 26 May 2023 – 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 (inside this document)
- the Formulae Booklet for AS Level Further Mathematics A
- 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

- 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 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  $g \text{ m s}^{-2}$ . When a numerical value is needed use  $g = 9.8$  unless a different value is specified in the question.

#### INFORMATION

- The total mark for this paper is **60**.
- The marks for each question are shown in brackets [ ].
- This document has **16** pages.

#### ADVICE

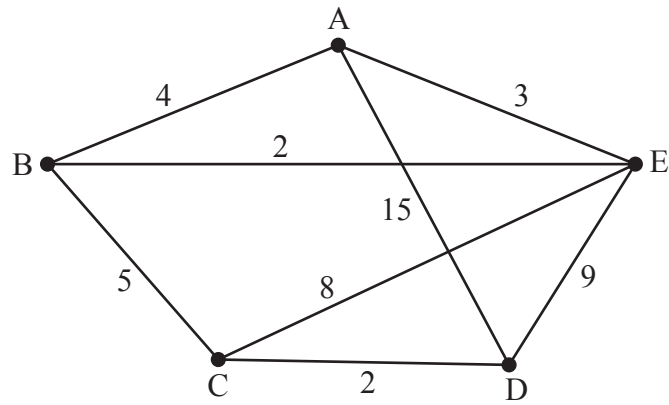
- Read each question carefully before you start your answer.

<b>1(a)</b>	

<b>1(b)</b>	

Space for diagram (if needed).

2(a)



Shortest path:

2(b)

Minimum spanning tree:

<b>3(a)(i)</b> <b>3(a)(ii)</b>	Original list:	23	10	18	7	62	54	31	82	
										Swaps
	First pass									
	Second pass									

<b>3(b)(i)</b> <b>3(b)(ii)</b>	Original list:	23	10	18	7	62	54	31	82	
										Swaps
	First pass									
	Second pass									

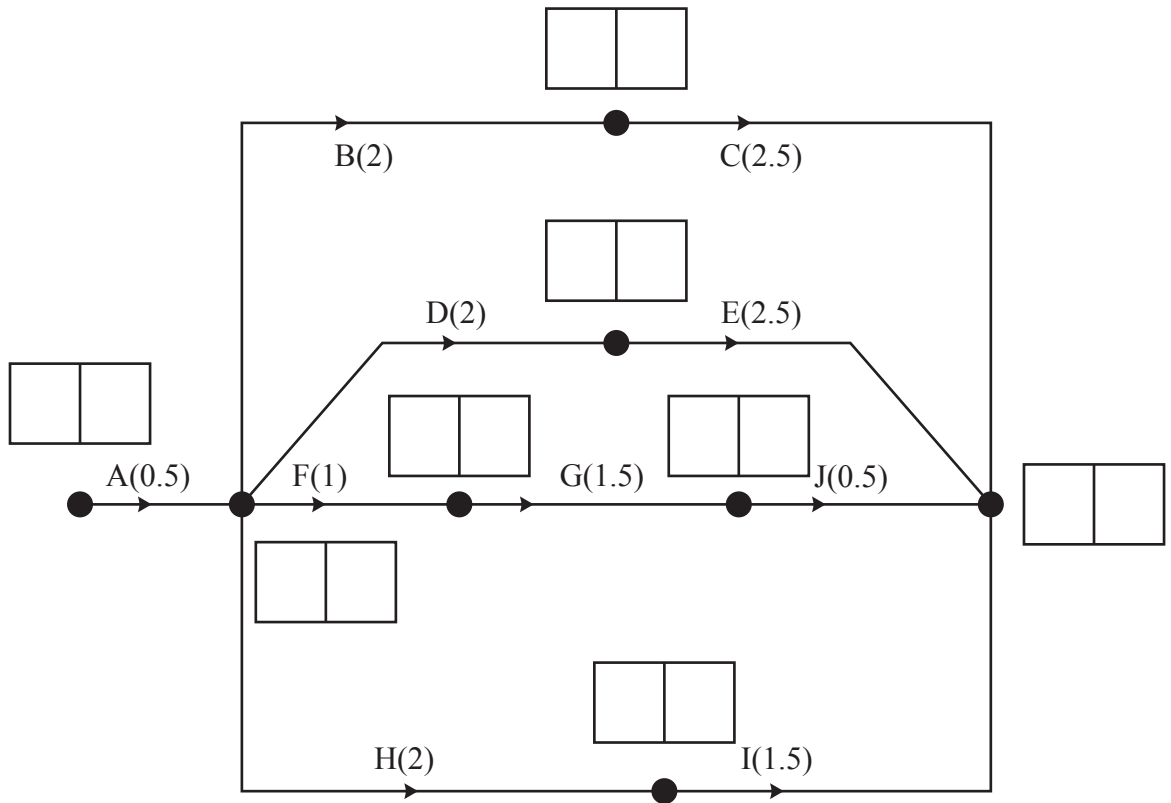
**(answer space continued on next page)**

<b>3(b)(i)</b> <b>3(b)(ii)</b>	<b>(continued)</b>
<b>3(c)</b>	
<b>3(d)</b>	

<b>4(a)(i)</b>	
<b>4(a)(ii)</b>	
<b>4(a)(iii)</b>	
<b>4(b)(i)</b>	

<b>4(b)(ii)</b>	
<b>4(b)(iii)</b>	
<b>4(b)(iv)</b>	

5(a)



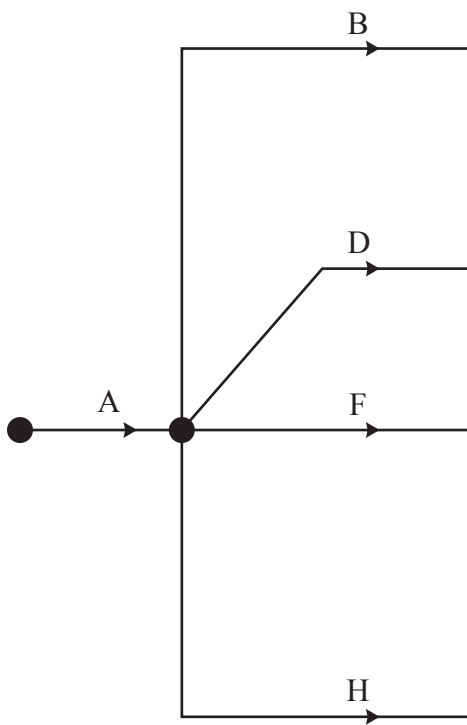
5(b)


Critical Activities:



5(c)


5(d)(i)



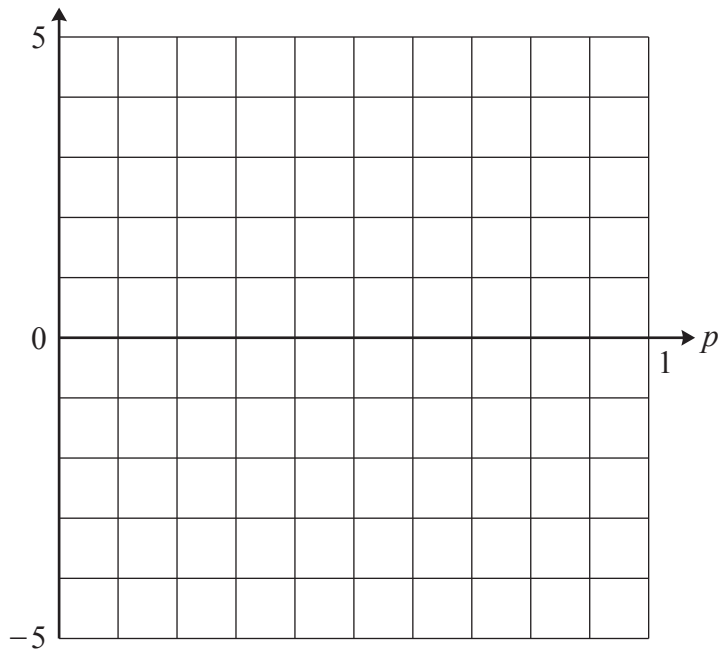
5(d)(ii)



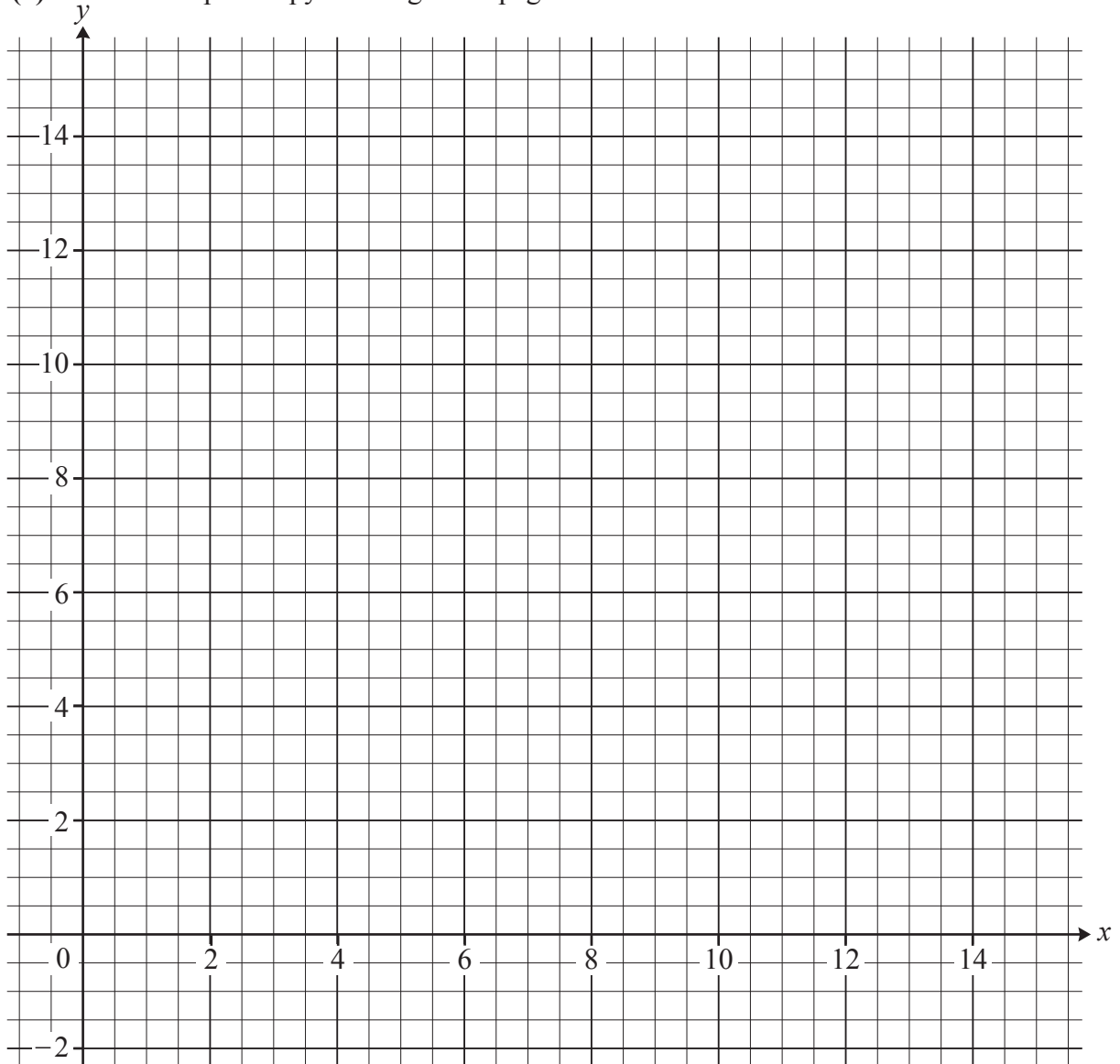

6(b) (continued)

Optimal mixed strategy:

Space for working (if needed).



7(a) There is a spare copy of this grid on page 16.



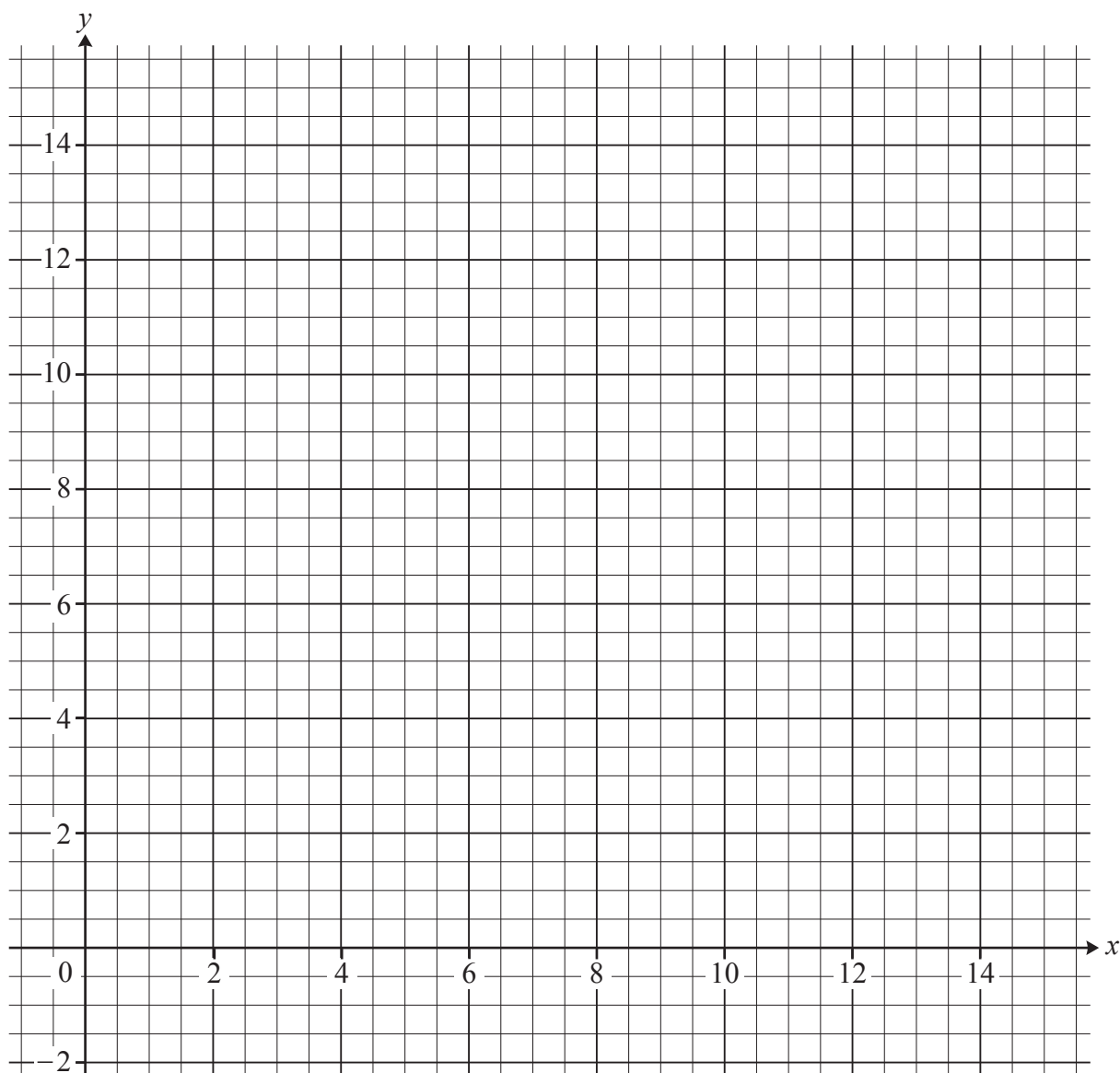
$P =$
$x =$
$y =$

<b>7(b)(i)</b>	
<b>7(b)(ii)</b>	
$P =$	
$x =$	
$y =$	





Spare copy of grid for question 7(a).



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