



Oxford Cambridge and RSA

**Thursday 26 May 2022 – 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 **12** pages.

**ADVICE**

- Read each question carefully before you start your answer.

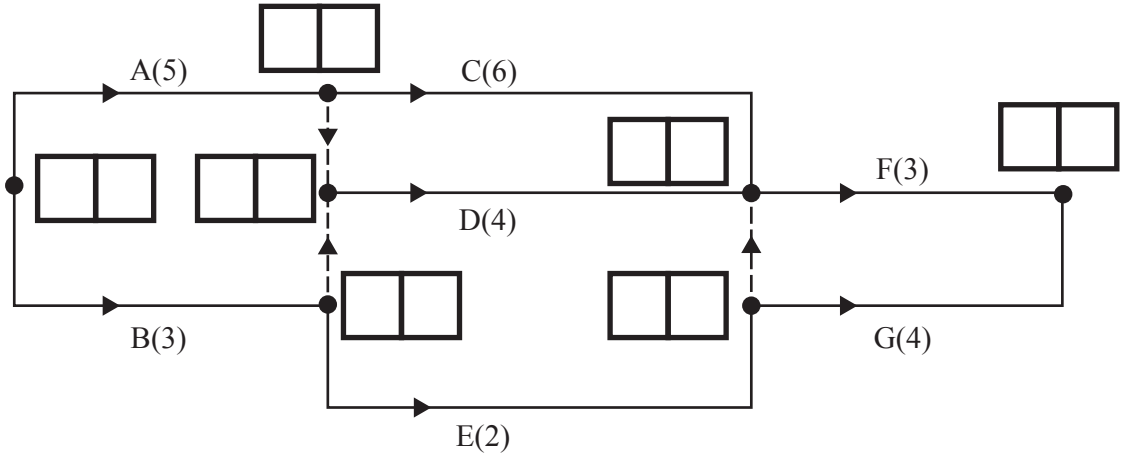
**1(a)**

| $X$ | $Y$ | $N$ | $M$ | $H$ | $D$ |
|-----|-----|-----|-----|-----|-----|
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Display:

**1(b)**

2(a)



2(b)

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
|   |   |   |   |   |   |   |

2(c)

Blank space for working out the project network, including identifying the critical path and calculating the maximum value of  $t$ .

Maximum value of  $t =$

Blank space for the final answer to 2(c).

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| <b>3(a)(i)</b> | 52 | 38 | 15 | 61 | 27 | 49 | 10 | 33 | 96 | 74 |
|                |    |    |    |    |    |    |    |    |    |    |
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| <b>3(a)(ii)</b> |             | Comparisons |  |  |  | Swaps |  |  |  |
|                 | First pass  |             |  |  |  |       |  |  |  |
|                 | Second pass |             |  |  |  |       |  |  |  |
|                 | Third pass  |             |  |  |  |       |  |  |  |

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|----------------|----|----|----|----|----|----|----|----|----|----|
| <b>3(b)(i)</b> | 52 | 38 | 15 | 61 | 27 | 49 | 10 | 33 | 96 | 74 |
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|-----------------|-------------|-------------|--|--|--|-------|--|--|--|
| <b>3(b)(ii)</b> |             | Comparisons |  |  |  | Swaps |  |  |  |
|                 | First pass  |             |  |  |  |       |  |  |  |
|                 | Second pass |             |  |  |  |       |  |  |  |
|                 | Third pass  |             |  |  |  |       |  |  |  |

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| <b>3(c)</b> |  |
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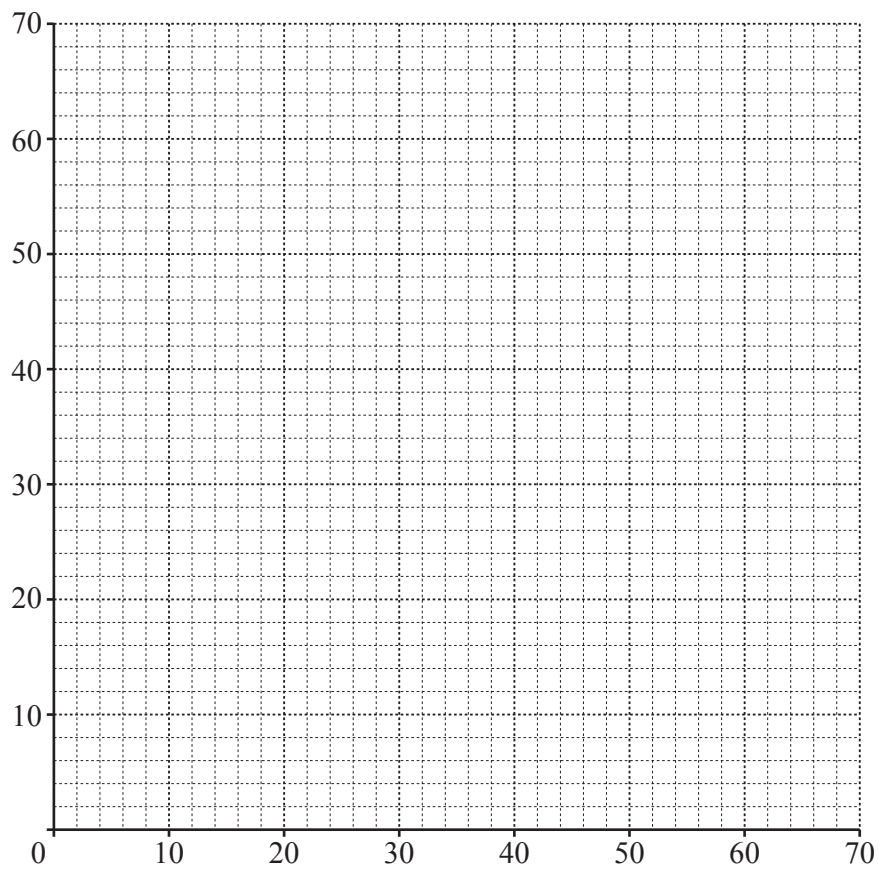
|             |  |     |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
|-------------|--|-----|---|-----|--|--|---|---|---|--|---|--|--|--------|---|--|--|--|---|--|--|
| <b>4(a)</b> | <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td></td> <td style="text-align: center;">Sam</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">6</td> </tr> <tr> <td style="border: none;"></td> <td style="border-top: 1px solid black; border-right: 1px solid black; text-align: center;">1</td> <td style="border-top: 1px solid black; border-right: 1px solid black;"></td> <td style="border-top: 1px solid black;"></td> </tr> <tr> <td style="border: none; text-align: right;">Kareem</td> <td style="border-right: 1px solid black; text-align: center;">2</td> <td style="border-right: 1px solid black;"></td> <td></td> </tr> <tr> <td style="border: none;"></td> <td style="border-right: 1px solid black; text-align: center;">5</td> <td style="border-right: 1px solid black;"></td> <td></td> </tr> </table> |     |   | Sam |  |  | 3 | 4 | 6 |  | 1 |  |  | Kareem | 2 |  |  |  | 5 |  |  |
|             |  | Sam |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
|             | 3  | 4   | 6 |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
|             | 1  |     |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
| Kareem      | 2  |     |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
|             | 5  |     |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
| <b>4(b)</b> |  |     |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
| <b>4(c)</b> |  |     |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
| <b>4(d)</b> |  |     |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |
| <b>4(e)</b> | <p>Expected score for Kareem when he plays the card numbered 2 is</p> <hr/> <hr/> <hr/> <p>Expected score for Kareem when he plays the card numbered 5 is</p> <hr/> <hr/> <hr/>  |     |   |     |  |  |   |   |   |  |   |  |  |        |   |  |  |  |   |  |  |

5(a)

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5(b)

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| <b>6(a)</b> |                 |
|             | Shortest route: |
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| <b>6(b)</b> |                 |
|             | Shortest route: |
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| <b>7(b)</b>     |  |
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| <b>7(c)(i)</b>  |  |
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| <b>7(c)(ii)</b> |  |
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