OCR
Oxford Cambridge and RSA

# Monday 5 June 2023 – Afternoon

## A Level Further Mathematics B (MEI)

**Y433/01** Modelling with Algorithms

Printed Answer Booklet

**Time allowed: 1 hour 15 minutes**

AB

**You must have:**
- Question Paper Y433/01 (inside this document)
- the Formulae Booklet for Further Mathematics B (MEI)
- a scientific or graphical calculator

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | | | Candidate number | | | | |

First name(s) _____

Last name _____

**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 your final answers to a degree of accuracy that is appropriate to the context.

**INFORMATION**
- This document has **16** pages.

**ADVICE**
- Read each question carefully before you start your answer.

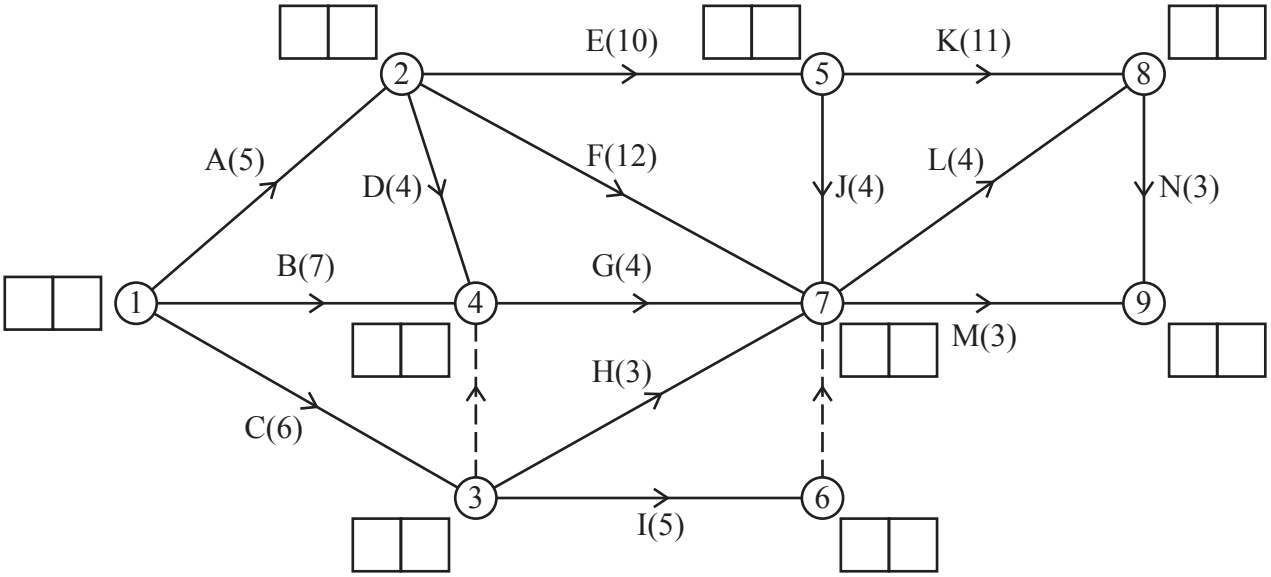
**1(a)**

**1(b)** 17 23 18 14 26 21 24 15 31 27

**1(c)**

**2(a)**

**2(b)**

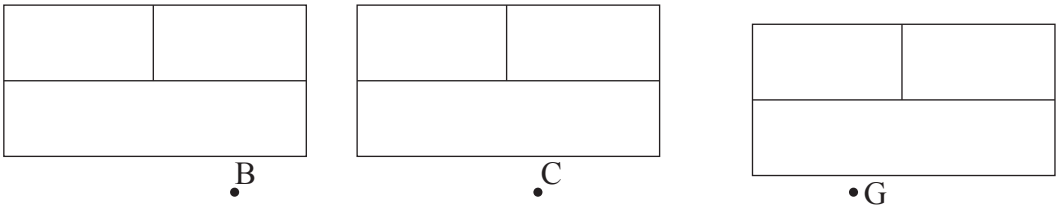


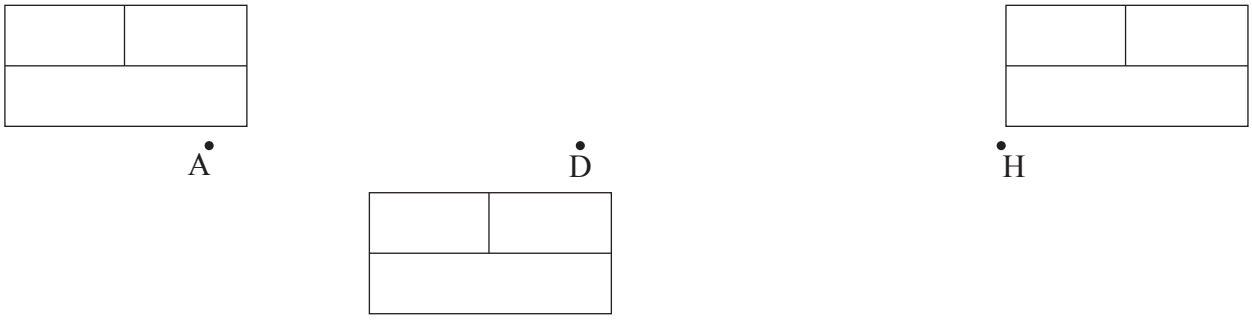

| |
|---|
| Minimum completion time: |
| Critical activities: |

**2(c)**

**2(d)**

**3(a) and 3(c)**





Key:
Order of labelling → ← Label
Working values (do not cross out) →

Shortest path from A to H:

**3(b)**

**4**

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

**4** **(continued)**

| | |
|---|---|
| **5(a)** | |
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| | |
| **5(b)(i)** | |
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| | |
| **5(b)(ii)** | |
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| | |
| **5(c)** | |
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| **5(d)** | |
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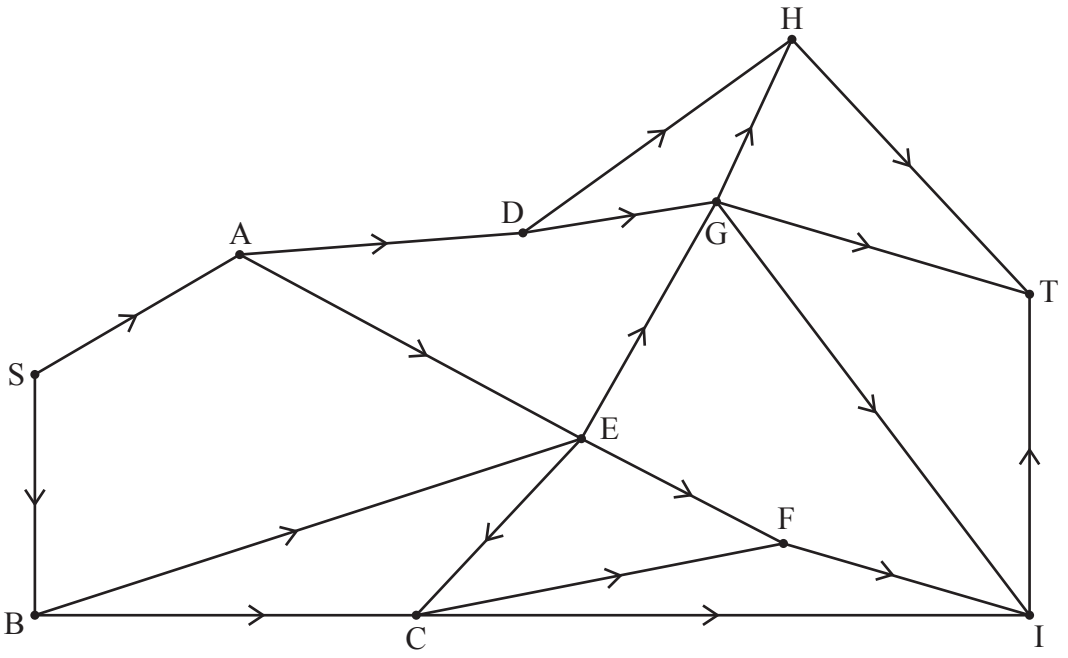
**5(e)**




Maximum flow through the network:

**5(f)**

**6(a)**

**6(b)**

**6(c)**

**6(d)**

| $P$ | $x$ | $y$ | $z$ | $s_1$ | $s_2$ | $s_3$ | RHS |
|---|---|---|---|---|---|---|---|
| 1 | 0 | $-\frac{21}{8}$ | 0 | 0 | $-\frac{1}{8}$ | $\frac{13}{8}$ | $\frac{665}{8}$ |
| 0 | 0 | $\frac{15}{8}$ | 0 | 1 | $\frac{3}{8}$ | $\frac{1}{8}$ | $b+\frac{205}{8}$ |
| 0 | 0 | $-\frac{3}{8}$ | 1 | 0 | $\frac{1}{8}$ | $\frac{3}{8}$ | $\frac{215}{8}$ |
| 0 | 1 | $-\frac{1}{4}$ | 0 | 0 | $-\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{5}{4}$ |

| $P$ | $x$ | $y$ | $z$ | $s_1$ | $s_2$ | $s_3$ | RHS |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**6(e)**

**6(f)**

| $Q$ | $P$ | $x$ | $y$ | $z$ | $s_1$ | $s_2$ | $s_3$ | $a_1$ | RHS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |

## 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).