

ENGLISH ELECTRIC-LEO-MARCONI COMPUTERS LIMITED

QUIS II

(One hour is allowed for this paper)

SURNAME (block capitals)

CHRISTIAN NAME(S)

DATE

APPLICATION FOR POST AS

TESTED AT

Have you taken a QUIS test before?

YES/NO (delete as appropriate)

If YES, please state:

Approximate date:

Place:

Organisation

Please do not open this booklet until told by the Supervisor

1	2	3	4	5	6	7	8	9	10	TOTAL

Problem 1 : (ADD INSTRUCTIONS)

Box No:

1	2	3
4	3	2

Initially:

Place 12 in box 1 and 11 in box 2
(Minimum number of instructions = 3)

SOLUTION

Use opposite page for rough work

Problem 2 : (ADD INSTRUCTIONS)

Box No:

1	2	3
20	15	10

Initially:

Place 45 in box 1 and 35 in box 3
(Minimum number of instructions = 3)

SOLUTION

20 15 25
35
15

Use opposite page for rough work

In subsequent problems you may use instructions of the following type:

SUBTRACT: $2 - 1 \rightarrow 2$

NOTE: The first and third box-numbers mentioned in a subtract instruction must be the same, e.g., the result of the subtraction Box 2 - Box 1 must be placed in Box 2, also

$$\begin{array}{r} 3 - 1 \rightarrow 3 \\ - \quad - \end{array}$$

or $\begin{array}{r} 1 - 3 \rightarrow 1 \\ - \quad - \end{array}$

Problem 3 : (ADD AND SUBTRACT INSTRUCTIONS)

Box No:

1	2	3
5	0	9

Initially:

Box 2 is known to be empty
Place 9 in box 1 and 5 in box 3
(Minimum number of instructions = 4)

SOLUTION:

Use opposite page for rough work

Problem 4 : (ADD AND SUBTRACT INSTRUCTIONS)

Box No:	1	2	3
Initially:	a	c	b

Place $c + 2b - 3a$ in box 1
(Minimum number of instructions = 4)

SOLUTION:

Use opposite page for rough work

In subsequent problems you may use instructions of the following type:

MULTIPLY: $1 \times 2 \rightarrow 3$

NOTE: As for addition, the box numbers may be used in any combination. Any two or all three box numbers may be the same, e.g:

$$2 \times 3 \rightarrow 1$$

$$1 \times 1 \rightarrow 1$$

Problem 5 : (ADD, SUBTRACT AND MULTIPLY INSTRUCTIONS)

Box No:

1	2
3	2

Initially:

Place 48 in box 1

(Minimum number of instructions = 3)

SOLUTION:

Use opposite page for rough work

. In subsequent problems you may use instructions of the following type:

DIVIDE: $2 \div 1 \rightarrow 2$

NOTES:

1. As in subtraction, the **first** and **third** box numbers must be the same.
2. Fractions disappear leaving only a whole number in the result box, e.g., 7 divided by 3 gives 2; 3 divided by 7 gives 0. (Any fraction of 1 becomes 0).
3. If a box is divided by itself the result is 1, unless the box originally contained zero.

Division by zero is not allowed.

Problem 6 : (ALL TYPES OF INSTRUCTION)

Box No:

1	2
?	x

Initially:

The contents of box 1 are unknown. (Box 1 may be empty, or it may not).

Box 2 contains the year of a man's birth (x).

Place the following year in box 1.

(Minimum number of instructions = 3)

SOLUTION:

Use opposite page for rough work

Problem 7 : (ALL TYPES OF INSTRUCTION)

Box No:

Initially:

1	2	3	4
0	0	x	20

The x in box 3 represents a sum of money in shillings. Place in box 1 the number of complete pounds contained in x and place in box 2 the number of shillings left over.

(Minimum number of instructions = 5).

SOLUTION:

Use opposite page for rough work

Problem 8 (All types of instruction)

Box No:

1	2	3
0	x	0

Initially:

x is a distance in feet.

Place in box 1 the number of complete yards contained in x , and place in box 3 the number of feet left over.

(Minimum number of instructions = 7)

SOLUTION:

Use opposite page for rough work

Problem 9 : (ALL INSTRUCTIONS BUT ADD AND SUBTRACT ARE SUFFICIENT)

1	2	3
?	x	y

x and y are positive whole numbers. Box 1 contains the larger of the two; replace it by the smaller.
(Minimum number of instructions = 2)

SOLUTION:

Use opposite page for rough work

Problem 10 : (ALL TYPES OF INSTRUCTION)

Box No:

1	2	3
?	?	?

Initially:

Box 1 contains 8 or 9

Box 2 contains 21, 22 or 23

Box 3 contains 28, 29 or 30

Write a sequence of instructions which will place 21 in box 2.

NOTE: Your solution must be valid for all combinations of the permitted numbers.

(Minimum number of instructions = 3)

SOLUTION:

Use opposite page for rough work

1	Box	1	2	3		6	Box	1	2		
	Initial Value	4	3	2			Initial Value	-	x		
	Target Value	12	11	-			Target Value	x+1	-		
	Steps	3					Steps	3			
	1 + 1 → 3	4	3	8			1 + 2 → 1	x+?	x		
	1 + 3 → 1	12	3	8			1 Div 1 → 1	1	x		
	2 + 3 → 2	12	11	8			1 + 2 → 1	x+1			
2	Box	1	2	3		7	Box	1	2	3	4
	Initial Value	20	15	10			Initial Value	0	0	x	20
	Target Value	45	-	35			Target Value	£	s		
	Steps	3					Steps	5			
	2 + 3 → 2	20	25	10			1 + 3 → 1	x	0	x	20
	2 + 3 → 3	20	25	35			1 Div 4 → 1	£	0	x	20
	1 + 2 → 1	45	25	35			2 + 3 → 2	£	x	x	20
							1 * 4 → 4	£	x	x	£ * 20
3	Box	1	2	3			2 - 4 → 2	£	s	x	£ * 20
	Initial Value	5	0	9							
	Target Value	9	-	5		8	Box	1	2	3	
	Steps	4					Initial Value	0	x	0	
	2 + 3 → 2	5	9	9			Target Value	Yds	-	Ft	
	2 - 1 → 2	5	4	9			Steps	7			
	1 + 2 → 1	9	4	9			Right steps but Ft in box 2 instead of box 3				
	3 - 2 → 3	9	4	5			1 + 2 → 1	x	x	0	
							1 + 2 → 3	x	x	2x	
							1 + 3 → 3	x	x	3x	
4	Box	1	2	3			3 Div 1 → 3	x	x	3	
	Initial Value	a	c	b			1 Div 3 → 1	Yds	x	3	
	Target Value	c+2b-3a	-	-			1 * 3 → 3	Yds	x	3Yds	
	Steps	4					2 - 3 → 2	Yds	Ft	3Yds	
	3 - 1 → 3	a	c	b-a		9	Box	1	2	3	
	3 + 3 → 3	a	c	2(b-a)			Initial Value	Max(x,y)	x	y	
	3 - 1 → 3	a	c	2b-3a			Target Value	Min(x,y)	-	-	
	2 + 3 → 1	c+2b-3a	c	2b-3a			Steps	2			
							Ans sign wrong				
5	Box	1	2				1 - 2 → 1	0 or y -x	x	y	
	Initial Value	3	2				1 - 3 → 1	-Min(x,y)	x	y	
	Target Value	48	-								
	Steps	3				10	Box	1	2	3	
	1 * 2 → 1	6	2				Initial Value	8 or 9	21, 22, 23	28, 29, 30	
	1 + 2 → 2	6	8				Target Value	-	21	-	
	1 * 2 → 1	48	8				Steps	3			
							3 Div 1 → 3	-	-	3	
							2 Div 3 → 2	-	7	3	
							2 * 3 → 2	-	21	3	