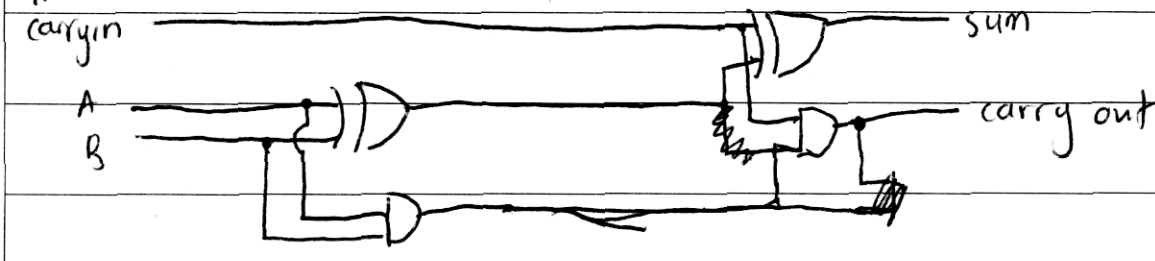
BOARD OF STUDIES
NEW SOUTH WALES

Question 25

a) i

A	B	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

ii



b) integer representation means that you may only have a whole number, i.e 1, 2, 3, 4, 5, 6 etc whereas a floating point number can have a decimal point anywhere in the number i.e 3·1 145·625 etc. The integer method would be appropriate in counting the number of students in a room, whereas the floating point method would be appropriate when determing the area of a circle i.e π is a floating point number

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0 = left down 1 = right up

c) ~~left or down, right or up, left or down, left or down~~

~~the car moves left or down 50 mm for the first~~ right or up

~~128 32 16 2~~ packet and then right or up

~~0 1 1 0 0 1 0 128+32+16+2 for~~

32+16+2

~~32+18~~

11 0

i the car moves in the right or up direction for 50 mm then in the right or up direction for 83 mm

~~1010011~~

~~64+16+3~~

~~64+19~~

83

ii add

$$\begin{array}{r} 0110010 \\ 1010011 \\ \hline 10000101 \end{array}$$

8+4+1

1101

$$\begin{array}{r} 1011 \\ 1101\,\overline{)\,10000101} \\ \cancel{01011000} \\ 10101000 \\ \hline 101101 \\ \cancel{010110} \\ 101010 \\ \hline 010111 \\ \cancel{001011} \\ 110101 \\ \hline 001100 \end{array}$$

10000101 ÷ 1101 = 1011 R 1100

so Remainder = 1100

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iii BEGIN

read stringIn

Check datastream length

IF correct THEN

check checksum
ELSE Disregard
ENDIF checksum correct THEN

extract movement data

ELSE Disregard

ENDIF

ENDIF

move car according to movement data

END.

BEGIN (check)

IF stringlength = 10 bits THEN

good data

ELSE bad data

ENDIF

END

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BEGIN (Extract)

IF movement data = good THEN

bit 2 = 1 move right + up

bit 2 = 0 move down + left

then move sum (bit 3 to bit 9) mm in desired direction)

ELSE disregard

END.