BOARD OF STUDIES
NEW SOUTH WALES

Question 25

Question 25.

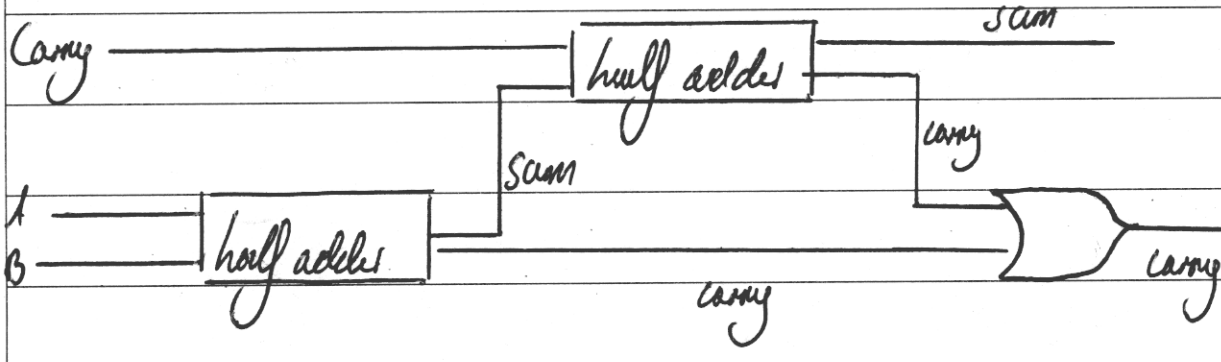
a). i Truth table

~~A B Output~~

~~no change~~

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

ii. Construction of full adder



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b). Integer representation, is a value which is a whole number eg. (1, 24, -10, 5). This means that negative numbers can be represented, but the number must be a whole one.

Floating point representation is a value which can have a decimal value. (0.125, 7.627, -10.1). These values can be negative, but unlike integer representation, do not have to be whole numbers.

c). i. ~~right, left, right, right, left, left, right, left.~~
~~up, up, down, up, down, down, up, up~~
right, 111 millimetres
up, 1111 millimetres

The car moves 3 millimetres right, then 4 millimetres up.

ii. 0101100101 +
0100100111
1000001100

1000001100 = $1\times2^9 + 1\times2^8 + 1\times2^3 + 1\times2^2$

= 2048 + 1024 + 8 + 4

= 3084

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$$13 \overline{)3084.30} \quad 237.\dot{2}3\dot{7}$$

13
26
39
52
65
78
91
104

∴ Remainder : 237

~~10110010 +~~
~~11,0100,111~~
~~01100001~~

ii. 10110010 +
1,1,0100,011
00000101

∴ 00000101 = $1 \times 2^2 + 1 \times 2^0$
= 5

∴ $0.3\dot{8}4\dot{4}$

$$13 \overline{)50.0_{1}6_{2}0_{3}0}$$

∴ Remainder is 0.384

iii. BEGIN Main program
Check Module
Movement data Module

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```
        Move car Module
END Main program

Begin Check Module
    IF third packet <> 0 THEN
        Print Data stream not correct length
    ELSE
        Begin Check sum Module
    ENDIF
END

BEGIN Check sum module
    Step 2 :
```