



12 Pages

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either read illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. **Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

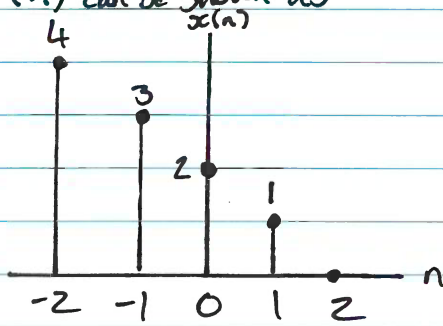
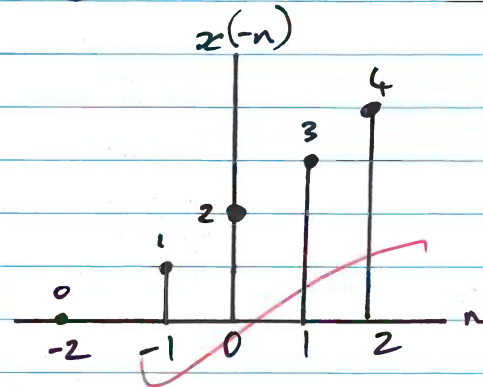
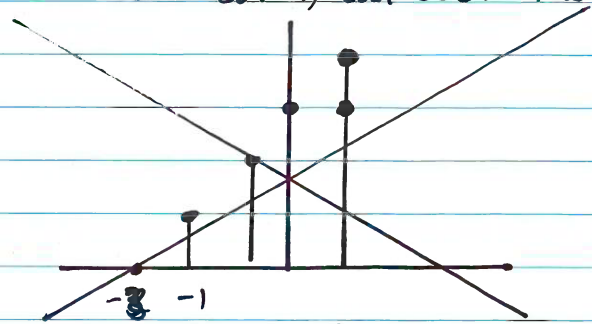
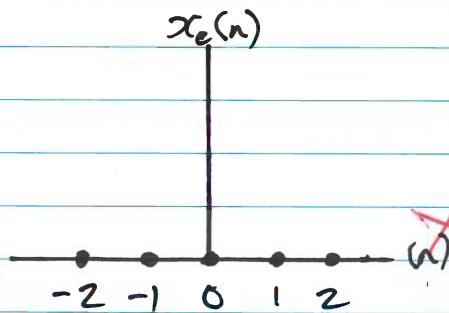
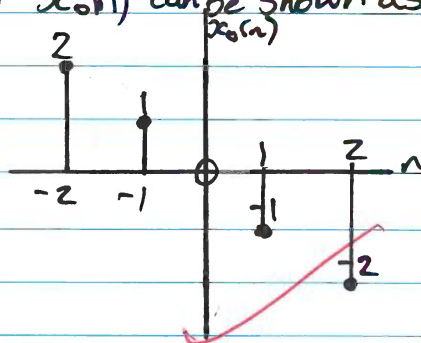
List the numbers of the questions you have attempted	Office Use
1	22
3	04
4	23
Total	49/100

(Gweler yr ochr arall am y fersiwn Cymraeg)

$$\frac{49}{100}$$

$$\begin{array}{r} 12 \overline{) 12526} \\ \underline{12} \\ 05 \\ \underline{00} \\ 05 \\ \underline{00} \\ 06 \end{array}$$

1

a) i) $x(n)$ can be shown astherefor $x(-n)$ can be shown aswe know that $x_e(n) = \frac{x(n) + x(-n)}{2}$ therefor $x_e(n)$ can be shown as:we know that $x_o(n) = \frac{x(n) - x(-n)}{2}$ therefor $x_o(n)$ can be shown as:

1) a) ii) $x_e(n) + x_o(n) = x(n)$

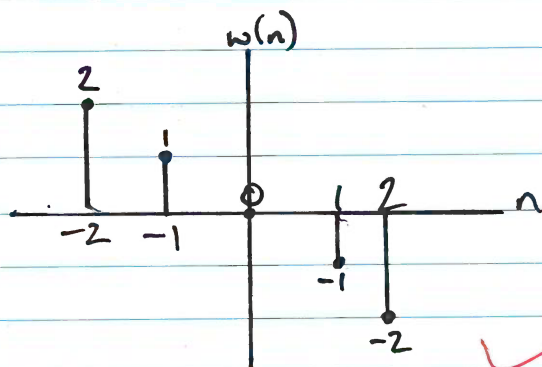
$$x_e(n) = \frac{x(n) + x(-n)}{2}$$

$$x_o(n) = \frac{x(n) - x(-n)}{2}$$

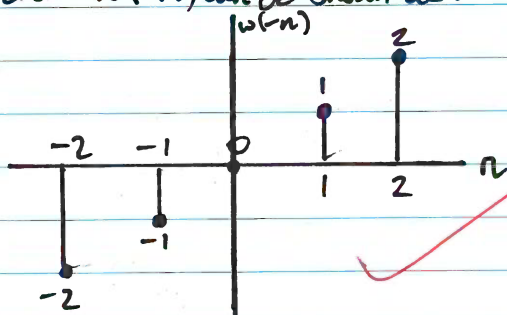
$$\frac{x(n) + x(-n) + x(n) - x(-n)}{2} = \frac{2x(n)}{2} = x(n)$$

a) iii) $w(n) = x_o(n)$

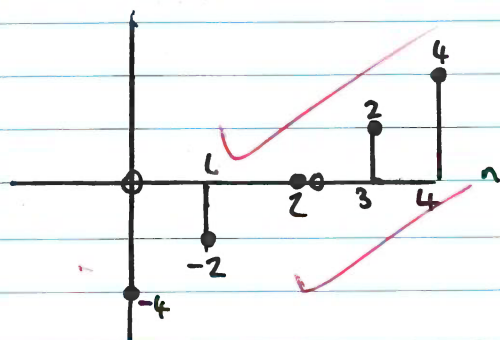
$w(n)$ can be shown as:



therefor $w(-n)$ can be shown as:



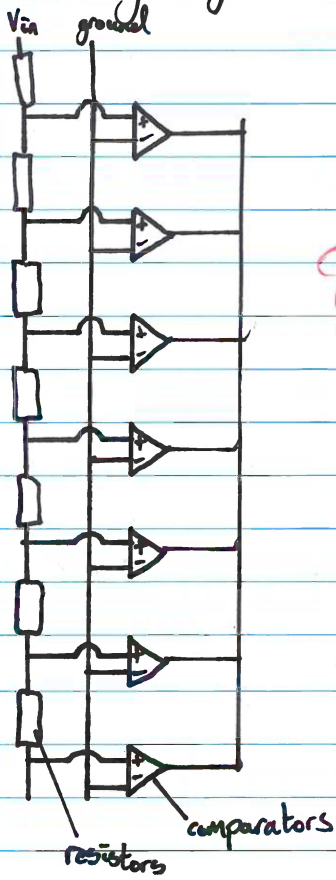
a) iv) $w(-n)$ scaled by 2 and shifted right by 2 can be shown as



3)a)2)

3)a)i)

Flash type ADC inputs the V_{in} to all comparators at the same instance, this way it generates a V_{out} .



??

3

04
25

Q4)a)i) ~~UART~~ UART is when a master slave sends information via binary to a slave. It first sends a start bit, which instructs the slave of an incoming signal. It then sends the information, followed by a parity bit, which allows for error checking followed by a stop bit, returning the slave to its idle state.

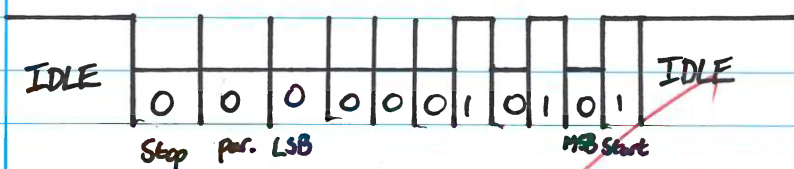
Q4)a)ii)

Q4)b)i) Binary representation of "PRINT"

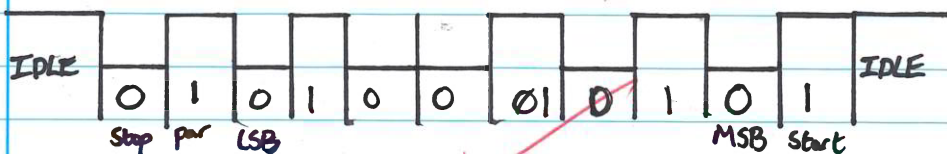
ASCII Hex	Binary (8421 8421)
P = 50	0101 0000 ✓
R = 52	0101 0010 ✓
I = 49	0100 1001 ✓
N = 4E	0100 1110 ✓
T = 54	0101 0100 ✓

Q4)b)ii) UART Data frame for "PRINT" with even parity (par.)

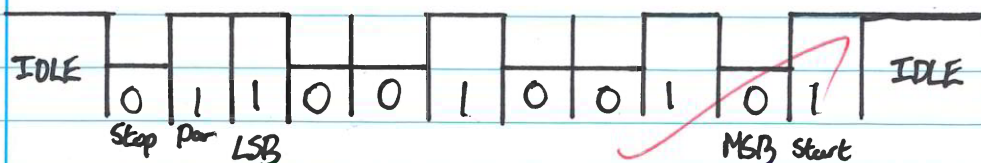
P = 0101 0000



R = 0101 0010

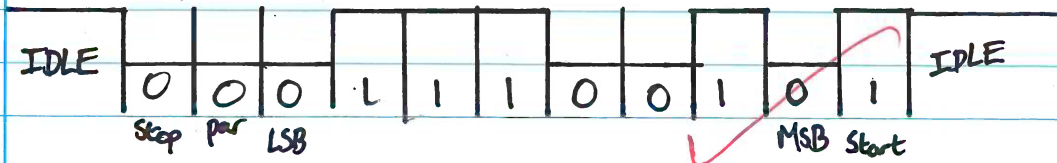


I = 0100 1001



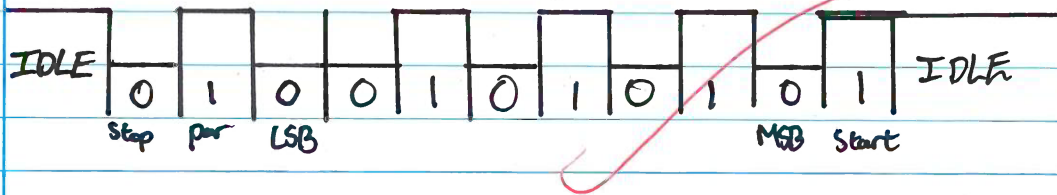
Continued over...

4)b)ii) $N = 0100\ 1110$



3 ✓

$T = 0101\ 0100$



3 ✓

23
25

23

