Assignment 1

Do the following calculations without the use of calculator. Show your work – handwritten neatly and take the snapshot of your work. Put all the snapshots in **ONE** pdf.

Look at the instruction clearly – no use of calculator – need to show your work clearly to show that you are not using calculator.

1. **Binary number addition:**
   a. 10110001 + 00011100 = 1100 1101
   b. 01010011 + 11001100 = ~~1~~ 0001 1111→ this is an 8 bit number – the most significant bit (bit 7) has a carry → would be captured by the Carry flag

2. **Hex addition**
   a. 2ACDAA24 + 1234AABC = 3D02 54E0
   b. 9AAD1278 + 12AABB56 = AD57 CDCE

3. **Single precision floating point addition. Normalise your answer.**
   a. $1.00110011001111100110001 \times 2^6 + 0.01110100010010100010011 \times 2^3$

   $1.00110011001111100110001 \times 2^6$

   $+\quad 0.01110100010010100010011 \times 2^3$

   $1.00110011001111100110001 \times 2^6$

   $+\quad 0.00001110100010010100010\ 011 \times 2^6$

   $1.01000001110001111010011\ 011 \times 2^6$

   →RS = 01 -> do nothing

   $1.01000001110001111010011 \times 2^6$

   →need to show the final answer without the round and sticky bits

4. **Decimal FP multiplication. Normalise your answer.**
   a. $2.31 \times 10^3 \times 8.11 \times 10^4 = 18.7341 \times 10^7 = 1.87341 \times 10^8$
   b. $4.5 \times 10^2 \times 5.2 \times 10^3 = 23.4 \times 10^5 = 2.34 \times 10^6$

5. **Binary FP multiplication. Normalise your answer.**
   a. $111_2 \times 1001_2 = 111111_2 = 1.11111 \times 2^5$
   b. $1.11 \times 2^2 \times 1.001 \times 2^3 = 1.11111 \times 2^5$

6. **FP division**
   a. $4.5 \times 10^2 / 2.5 \times 10^3 = 1.8 \times 10^{-1}$