Question #1:-

$A = 7.75$

$= 111.11_2$

$= 1.1111 \times 2^2$

Adding bias
$= 1.1111 \times 2^{2+127}$

$= 1.1111 \times 2^{128}$

$= 0.11111 \times 2^{130}$

$B = 10$

$= 1010_2$

$= 1.01 \times 2^3$

Adding bias
$= 1.01 \times 2^{3+127}$

$= 1.01 \times 2^{130}$

$\downarrow$ 2's complement

$= 0.\cancel{\$}1 \times 2^{130}$

---

sign bit

$\downarrow$
$\underset{00}{0} 0 . \overset{1000}{11111} 1 \times 2^{130}$

$\rightarrow \cancel{0}1 0 . 11000 \times 2^{130}$

11.10111×2^{130} Sign bit indicates it is a -ve number

$\downarrow$ 2's complement

$= 00.01001 \times 2^{130}$

$= 1.001 \times 2^{128}$

| 1 | 10000000 | 00100000000000000000000000 |

Question #2 :-

```
addi    $t0, $zero, 100
addi    $t1, $zero, 55

for:
        slti   $t2, $t1, 0
        bne    $t2, $zero, exit
        sll    $t3, $t1, 3
        add    $t4, $s0, $t3
        sll    $t5, $t1, 2
        add    $t6, $s1, $t5
        lw     $t7, 0($t6)
        sub    $t8, $t0, $t7
        sw     $t8, 0($t4)
        addi   $t1, $t1, -1
        j for

exit:
```

Question #3 :-

PC

Instruction
Memory

Register
File

write
Data

rs
rt
rd

reg [rs]

reg [rt]

ALU

Sign
Extension

Adder

Read
Data
Memory