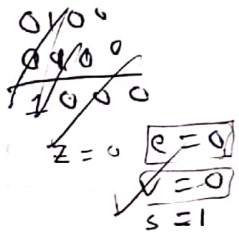
1705091 Nahian Salsabil

1. (I) b
II. a
III. c
IV. b
V. a
VI. c
VII. d
VIII. a
IX. a



3. (a) We can use negative numbers as exponent in floating point addition using bias. So, we use bias for the benefit of comparison.

(b)

	Exponent	fraction
for zero:	0	0
for infinity:	255 (single precision)	0
	2047 (double precision)	0

4. (a) Largest:

exponent 1110, actual exponent = 14 - 7 = 7

Fraction 11111111111 (11bit)

significand 1

largest = 1.0×2^{7}

Smallest:

exponent 0001, actual = 1 - 7 = -6

fraction 000...00 (11bit)

significant 1

smallest = 1.0×2^{-6}

(b) largest:

exponent 11110, actual = 30 - 15 = 15

fraction 11...11 (10bit)

significand 1

largest = 1.0×2^{15}

smallest:

exponent 00001, actual = 1 - 15 = -14

fraction, 00...00 (10bit)

significand 1

smallest number = 1.0×2^{-14}

6. $91 \% 3 = 1$

∴ instruction = sw

- wires: a, b, e, f, h, q, d, c, o, j, l, m, p, r

Control signals:

AluSrc
MemWrite

$m_2 - 0$

$m_1 - 0$

$m_3 - 1$

$m_4 - 0$

5. (b) if (WB.regwrite
and (WB.registerrd ≠ 0)
and (WB.registerrd = ID.registers))

ForwardA = 10

if (WB.regwrite
and (WB.registerrd ≠ 0)
and (WB.registerrd = ID.registert))

ForwardB = 10

(a)