

# Solution Diag. Test

①


$F = A \cdot \bar{C} + \bar{B} \cdot \bar{D}$

1C

② 2A

③ fraction field for normalized number has decimal value  $[1, 2)$

$9 = \frac{9}{8} \cdot 8 = \frac{9}{8} \cdot 2^3 \rightarrow 3 + 15 = 18$  (excess)

3A

bit pattern 0000010010

④

$F_1 F_0 X$	$F_1^+ F_0^+$
000	11
001	01
010	10
011	10
100	01
101	11
110	00
111	00

$D_{F_1}$

1	0	1	1
0	1	0	0

$D_{F_1} = \bar{F}_1 \cdot \bar{F}_0 \cdot X + \bar{F}_1 \cdot F_0 + F_1 \cdot \bar{X}$

4D

⑤ output only depends on state.

$Z = F_1 \cdot F_0$

5A

⑥ use documentation fig. 5-2

$\langle op \rangle \langle rd \rangle \langle op3 \rangle \langle rs1 \rangle \langle bit13 \rangle \langle sign(3) \rangle$

000011 100110 00001 1 0000000001010

8 7 3 0 6 0 0 A.

6C

7 (7a) no, that instruction is at decimal address 8 (X)

(7b) due to the bneg instruction negative numbers are not added (X)

(7c) I don't see a ST instruction so the main memory is not changed

7C

8

	init	after 1108	after 1109	after 1110
%R0	0	0	0	0
%temp0	10	-1	-1	-1
%temp1	20	20	20	20
%temp2	30	30	30	0

8A

9 See fig 5-13 (documentation)

$$\begin{array}{r} 1108 \ 2 \ 0 \\ 554 \ 2 \ 0 \\ 277 \ 2 \ 1 \\ 138 \ 2 \ 0 \\ 69 \ 2 \ 1 \\ 34 \ 2 \ 0 \\ 17 \ 2 \ 1 \\ 8 \ 2 \ 0 \\ 4 \ 2 \ 0 \\ 2 \ 2 \ 0 \\ 1 \end{array} \rightarrow \begin{array}{r} 1 \ 0 \ 0 \\ op \\ 0 \ 1 \ 0 \ 1 \ 0 \ 1 \ 0 \ 0 \\ op3 \end{array}$$

9A

10 none of these

10D