1. Under what circumstances will the addition of two binary numbers in 2's complement representation, one of which is negative and one positive, result in an invalid result?
   a. if the result appears negative.
   b. if the result appears positive.
   c. never.
   d. always.
   e. none of the above.

2. What is the decimal equivalent of the IEEE-754 floating point number
   `1 10000010 00010000000000000000000`
   a. -17.0   **c.** -4.25   **e.** -1.06125
   b. -8.5   **d.** -2.125

3. Add the numbers represented by `x04D` and `x074`
   a. `x11F`   **c. x0C1**   **e.** `x0E4`
   b. `x0B1`   **d.** `x0E1`

4. Evaluate the bitwise OR expression:
   `xABCD OR x1234`
   a. `xFFFD`   **c.** `xBABA`   **e.** `xBE01`
   b. `x0204`   **d. xBBFD**

5. What does the following logic expression simplify to?
   `NOT( NOT(A) OR  NOT(B) )`
   a. A AND B   **c.** `A NAND B`   **e.** `A XOR B`
   b. `A OR B`   **d.** `A NOR B`

6. What is the result of the operation: `NOT( 1000 AND (1100 OR 0101) )`
   a. 0111   **b.** `1000`   **c.** `1111`   **d.** `0000`

7. Given the instruction (located at address xA400)

   `xA400          LDR  R1,  R2,  x0`
   and given: `R2` contains the value `xB000`; memory location `xB000` contains the value `xFFFF`; and memory location `xB020` contains the value `x000F`;
   What value will `R1` contain after the instruction executes?
   a. `xA400`   **c.** `xB020`   **e.** `x000F`
   b. `xB000`   **d. xFFFF**

8. The LC-3 does not have the operation "OR". Which of the following combinations of LC-3 instructions would be the equivalent of `OR R3, R1, R2` (i.e. bitwise OR the contents of R1 and R2 and store the result into R3)?

a. `AND R3, R1, R2`
`NOT R3, R3`

b. NOT R1, R1
NOT R2, R2
AND R3, R1, R2
NOT R3, R3

c. `NOT R1, R1`
`ADD R1, R1, #1`
`ADD R3, R1, R2`
`NOT R3, R3`

d. `AND R1, R1, #1`
`AND R3, R1, R2`
`NOT R3, R3`

e. `AND R3, R1, R2`
`NOT R1, R1`
`AND R3, R3, R1`

f. `NOT R1, R1`
`NOT R2, R2`
`AND R3, R1, R2`

9. Simplify the Boolean expression:
`a.b'.c'.d + a.b'.c.d + a.b.c'.d + a.b.c.d' + a.b.c.d`

a. `a.b.c + a.b.d + b.c.d`

b. a.d + a.b.c

c. `a.c + a.b.d`

d. `a.c + b.d + b.c`

e. can't be simplified

10. What is the logic expression for the truth table shown here, in the form `Out = f(A, B, C)`?

a. `Out = A . B + A . C`

b. `Out = A . B' + A . C`

c. `Out = A . B . C + A' . C`

d. Out = A . B . C + A' . B' . C'

e. `Out = A . B + A . C + B . C`

A	B	C	Out
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

.