1.
   a. .ORIG x3001
   b. AND R0, R0, #0 ; R0 <- 0
   c. NOT R1, R1
   d. ADD R1, R1, #1
   e. ADD R3, R1, R2
   f. BRz x3008
   g. BRn x300C
   h. BRp x300A
   i. ADD R0, R0 #0
   j. BRnzp x300d
   k. ADD R0, R0, #1
   l. HALT
2.
   a. .ORIG x3000
   b. AND R0, R0, #0
   c. AND R3, R3, #0
   d. ADD R3, R3, #1
   e. AND R2, R5, #4
   f. BRz x3006
3.
   a. .ORIG x3000
   b. AND R0, R0, #0
   c. ADD R0, R0, #1
   d. AND R3, R3, #0
   e. ADD R3, R3, #1
   f. AND R2, R5, #4
   g. BRz x3007
4.
   a. .ORIG x3000
   b. AND R1,R1, #0 ; FINAL RESULT
   c. AND R3,R3, #0 ; PLACEHOLDER
   d. AND R4,R4, #0 ; INCREMENT
   e. ADD R4, R4, #15
   f. ADD R4, R4, #1
   g. ADD R3, R3, #1
   h. LOOP AND R6, R0, R3
   i. BRz, INCREMENT
   j. ADD R1, R1, #1
   k. ADD R3, R3, R3
   l. INCREMENT ADD R4, R4, #-1
   m. BRz, LOOP
   n. .END
5.

a. .ORIG x3005
b. 1110 010 000001011
c. 0110 100 010 000000
d. 0001 100 100 1 11101
e. 0000 011 111111110
f. 1111 0000 00011001
g. .END

6.
a. .ORIG x3000
b. LD R2, PLACEHOLDER
c. ADD R3, R3, R2
d. ST R3, A
e. HALT
f. A .FILL #0
g. PLACEHOLDER .FILL #30
h. .END

7. HALT tells the simulator to stop a program that is running, .END tells the assembler to stop assembling the code