

First: _____ Last: _____

This is a closed book exam. You must put your answers on this piece of paper only. You have 50 minutes, so allocate your time accordingly. *Please read the entire quiz before starting.*

(5) Question 1. Give the hex value.....	-90 = -128+32+4+2 = %10100110 = \$A6
(5) Question 2. Specify 0 or 1	50-210 = -160, doesn't fit into 0 to 255 C=1
(5) Question 3. Specify 0 or 1	50+ -60 = -10, does fit -128 to +127 V=0
(5) Question 4. Specify A-H	Precision is 101 alternatives, signed A) 8-bit signed fixed-point, Δ = 0.1
(5) Question 5. Show the equation....	Divide last to reduce dropout $Z = (123*X - 660*Y + 500)/1000$
(5) Question 6. Show the machine code....	\$62, \$70
(5) Question 7. How many binary bits?.....	3½ decimal digits is 2000 alternatives 2048 is 11 binary bits
(5) Question 8. Specify values.....	RegA=\$56 RegX = \$1234

(10) Question 9. Simplified memory cycles (you may or may not need all 5 entries)

R/W	Addr	Data	Changes to A,B,X,Y,S,PC,IR,EAR
R	\$4123	\$62	IR=\$62, PC=\$4124
R	\$4124	\$0A	EAR=\$380A, PC=\$4125
R	\$380A	\$0A	
W	\$380A	\$0B	

(25) Part 10a) Write the main program

```

DDRM equ $0252 ; Port M Direction
DDRT equ $0242 ; Port T Direction
PTM  equ $0250 ; Port M I/O Register
PTT  equ $0240 ; Port T I/O Register
      org $4000
main lds #$4000      ; stack grows down from $3FFF
;option 1, simple
      ldaa DDRT
      anda #$BF      ; PT6 input
      oraa #$20      ; PT5 output
      staa DDRT
;option 2, efficient
      bclr DDRT,$$40 ; PT6 input
      bset DDRT,$$20 ; PT5 output
loop bsr  Check
      bra  loop
      org $FFFE
      fdb main

```

(25) Part 10b) Write the assembly language subroutine.

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;*****Check*****
; if PT6 is 1, then set PT5=1
; if PT6 is 0, then return without modifying PT5
;option 1, simple
Check ldaa PTT
      anda #$40
      beq done      ; skip if PT6 is zero
      oraa #$20      ; set PT5
      staa PTT
done  rts

;option 2, efficient
Check brclr PTT,$$40,done ; skip if PT6 is zero
      bset PTT,$$20      ; set PT5
done  rts

```