

This print-out should have 16 questions, check that it is complete. Multiple-choice questions may continue on the next column or page: find all choices before making your selection. The due time is Central time.

EE319K Chapter 10 homework.

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**001** (part 1 of 1) 10 points

The measurement system range is 0 to 1,999,999. How many decimal digits is it?

1. 5 decimal digits
2. 6 3/4 decimal digits
3. 6 decimal digits
4. 7 3/4 decimal digits
5. 7 decimal digits
6. 6 1/2 decimal digits
7. 7 1/2 decimal digits
8. 5 3/4 decimal digits
9. 5 1/2 decimal digits

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**002** (part 1 of 1) 10 points

Using a 16-bit unsigned binary fixed-point number format with a resolution of  $2^{-10}$ , determine the integer part of the fixed-point number that represents the value of  $\sqrt{51}$ .

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**003** (part 1 of 1) 10 points

Using a 16-bit unsigned decimal fixed-point number format with a resolution of  $10^{-4}$ , determine the integer part of the fixed-point number that represents the value of  $\sqrt{22}$ .

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**004** (part 1 of 1) 10 points

When performing integer arithmetic, does the associative principle hold for multiplication and division? In particular, is the following equation true?  $(A * B)/C = A * (B/C)$

1. There is not enough information to decide

whether or not it is correct.

2. No, there are situations where it is not correct.
3. Yes, it is always true.

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**005** (part 1 of 1) 10 points

Assume port C bit 3 is already configured as an output pin. The purpose of the following assembly code is to clear output bit 3 low.

```
ldaa  PORTC
anda  #???
staa  PORTC
```

What numerical value should you use in the ??? position in the above program? Give your answer as an unsigned 8-bit decimal number between 0 and 255.

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**006** (part 1 of 1) 10 points

Assume port C bit 3 is already configured as an output pin. The purpose of the following assembly code is to set output bit 3 high.

```
ldab  PORTC
???   #8
stab  PORTC
```

Which op code should you use in the ??? position in the above program?

1. *orab*
2. none of these choices is correct
3. *bitb*
4. *clrb*
5. *andb*
6. *eorb*

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**007** (part 1 of 1) 10 points

A serial port is configured to run at a baud rate of 4800 bits/sec. The protocol is 8 bit data, 1 stop, and no parity. What is the bandwidth of this port in bytes/sec?

Answer in units of bytes/sec.

**008** (part 1 of 1) 10 points

A serial port should be configured to run at the baud rate of 4800 bits/sec. The protocol is 8 bit data, 1 stop, and no parity. Assume the 6812 E clock, P clock and M clock are all 8 MHz.

```
ldd    #???
std    SC0BD
```

What 16-bit value should be written into the **SC0BD** register?

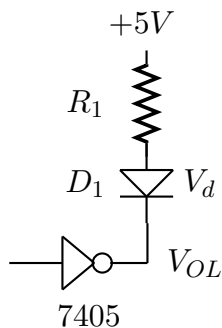
**009** (part 1 of 1) 10 points

Assume the analog input signal applied to ADC channel 5 is 2.21 volts. What numerical value would be returned by the following subroutine? Give your answer as an unsigned 8-bit decimal number between 0 and 255.

```
ADCIn  ldab    #5
        stab    ATDCTL5
check  ldab    ATDSTAT
        bpl     check
        ldab    ADR0H
        rts
```

**010** (part 1 of 1) 10 points

The following figure shows the electronic circuit used to interface an output port of the microcomputer to a LED. Assume the value of desired operating point of the LED is  $V_d = 2.8$  V, and  $I_d = 14$  mA. Assume also the output low voltage of the 7405 is  $V_{OL} = 0.5$  V.



What value for the resistor  $R_1$  should be used? Answer in units of  $\Omega$ .

**011** (part 1 of 1) 10 points

Assume the ADC precision is 10 bits, and the range is from 0 volts to 10 volts. What is the resolution of this ADC? Give your answer in

volts.

Answer in units of volts.

**012** (part 1 of 2) 10 points

Consider the following main program that passes one 8-bit parameter to a subroutine using the stack. The subroutine reverses the bits. **n** is the 8-bit input parameter, and **cnt** is the 8-bit local variable.

```
main    lds    #$0c00    init stack
        ldaa   #47
        psha
        jsr   bitrev   call sub
        leas  1,s      balance stack
loop    bra   loop
n       set   nnn      binding
cnt     set   ppp      binding
bitrev  pshx
        tsx
        movb  #8,1,-s  allocate cnt=8
bloop   lsr   n,x      shift n
        lsla
        dec  cnt,x    loop counter
        bne  bloop
        txs
        pulx
        rts
```

What value should you use in the **nnn** position to implement the proper binding of parameter **n**?

**013** (part 2 of 2) 10 points

What value should you use in the **ppp** position to implement the proper binding of local variable **cnt**?

**014** (part 1 of 1) 10 points

What is the basic operation of the **ediv** instruction?

1. 16-bit **RegY** divided by 16-bit **RegX** yielding a 16-bit quotient stored in **RegY**, and a 16-bit remainder stored in **RegD**.

2. 32-bit **RegsY:D** divided by 16-bit **RegX** yielding a 16-bit quotient stored in **RegD**, and a 16-bit remainder stored in **RegY**.

3. 32-bit **RegsX:D** divided by 16-bit **RegY**

yielding a 16-bit quotient stored in **RegX**,  
and a 16-bit remainder stored in **RegD**.

**6.  $\text{base} + \text{I} + \text{J}$**

**4.** 32-bit **RegsY:D** divided by 16-bit **RegX**  
yielding a 16-bit quotient stored in **RegY**,  
and a 16-bit remainder stored in **RegD**.

**5.** 32-bit **RegsD:Y** divided by 16-bit **RegX**  
yielding a 16-bit quotient stored in **RegY**,  
and a 16-bit remainder stored in **RegD**.

**6.** None of these choices is correct.

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**015** (part 1 of 1) 10 points

Consider a matrix with 3 rows and 6 columns,  
stored in column-major zero-index format.  
Each element is 2 bytes or 16 bits. Which  
equation correctly calculates the address of  
the element at row I and column J?

**1.  $\text{base} + 2 * \text{I} + 2 * \text{J}$**

**2.  $\text{base} + 2 * \text{I} + 6 * \text{J}$**

**3.  $\text{base} + 2 * \text{I} + 12 * \text{J}$**

**4.** None of these choices is correct.

**5.  $\text{base} + 12 * \text{I} + 2 * \text{J}$**

**6.  $\text{base} + 6 * \text{I} + 2 * \text{J}$**

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**016** (part 1 of 1) 10 points

Consider a matrix with 6 rows and 4 columns,  
stored in row-major zero-index format. Each  
element is 1 byte or 8 bits. Which equation  
correctly calculates the address of the element  
at row I and column J?

**1.  $\text{base} + \text{I} + 4 * \text{J}$**

**2.  $\text{base} + 6 * \text{I} + \text{J}$**

**3.  $\text{base} + \text{I} + 6 * \text{J}$**

**4.** None of these choices is correct.

**5.  $\text{base} + 4 * \text{I} + \text{J}$**