Questions

1. Create a memory map for Code and Peripheral address spaces of the MSP432P401R.

ADDRESS RANGE	MEMORY REGION	DESCRIPTION
0x0000_0000 – 0x1FFF_FFFF	CODE	Program code/data
0x2000_0000 – 0x3FFF_FFFF	SRAM	Data/bit band/alias areas
0x4000_0000 – 0x5FFF_FFFF	PERIPHERAL	Bit Band/alias areas
0x6000_0000 – 0xDFFF_FFFF	RESERVED	Reserved
0xE000_0000 – 0xE00F_FFFF	PRIVATE PERIPHAL BUS	NVIC/sys timer/sys ctrl block
0xE010_0000 – 0XFFFF_FFFF	RESERVED	

Source: Technical Reference Manual, P. 52 – 1.4.3 Behavior of Memory Accesses

2. How many internal oscillators does the MSP432 have?

5 Internal Oscillators

1. DCOCLK – programmable frequencies, 3Mhz default
2. VLOCLK – 9.4kHz frequency
3. REFOCLK – 32.768kHz or 128kHz frequency
4. MODCLK – 25Mhz frequency
5. SYSOSC – 5Mhz frequency

Source: Technical Reference Manual, P.305 – 5.1 Clock System Introduction

3. How many timers does the MSP432P401R have? What size are the timers?

3 Timers

1. Watchdog Timer
2. Timer A
3. Timer 32

Source: Technical Reference Manual

4. What is the maximum sampling rate of the analog to digital converter on the MSP432P401R?

Max sampling rate is 1 Msps in REGULAR mode, 200ksps in LOW POWER mode.

Source: Technical Reference Manual, P.686, Table 20-5

5. What is the equation for determining the digital output of the analog to digital converter when operating in single-ended mode on the MSP432?

$$N_{ADC} = 16834 \times \frac{V_{in+} - V_{R-}}{V_{R+} - V_{R-}}, 1LSB = \frac{V_{R+} - V_{R-}}{16834}$$

Source: Technical Reference Manual, P.667 – 20.2.1 14-Bit ADC Core

6. Which register is the primary mechanism for changing power modes on the MSP432?

PCMCTL0 Register

Source: Technical Reference Manual, P. 370 – 7.24.1 PCMCTL0 Register, Table 7-10

7. When the temperature goes up, does the general I/O output current from the MSP432 go up or down?

The current increases.

Source: MSP432 Datasheet. Multiple Graphs show output current to increase when temp increases.

8. The high drive I/O on the MSP432P401R produces more current by a factor of X. Estimate X according to the datasheet