**6-5 MIPS to Machine Language WS** **Name: Helena Fu**

1. Convert the following MIPS instruction to machine code.
Format your answer as a 32-bit hexadecimal number, e.g. 0xBAADCAFE. Leave any unused bits as 0.

| | |
|---|---|
| sub $t2,$s0,$s1<br>0/22  10, 16, 17<br>0 16 17 10 22hex = 0010 0010<br>000000 10000 10001 01010 00000 100010<br>0000 0010 0001 0001 0101 0000 0010 0010 | Decimal<br>0 16 17 10 34<br>~~0x01011A22~~<br><br>0x 02115022 |

2. Convert the following MIPS instruction to machine code.
Format your answer as a 32-bit hexadecimal number. Leave any unused bits as 0.

| | |
|---|---|
| sll $a0,$t0,2<br>sll 4 8 amt 2<br>0 0 8 4 2 00<br>0000,00 00,000 0,1000, 0010,0 000,10<br>00,0000 | Decimal<br>0 8 2 4 0<br>~~0x08240~~<br>0000 0000 0000 1000 0010 0000 1000 0000<br>0x00082080 |

3. Convert the following MIPS instruction to machine code.
Format your answer as a 32-bit hexadecimal number. Leave any unused bits as 0.

| | |
|---|---|
| lw $t0, 4($s0)<br>lw $s0 $t0  4<br>lw 16 8 0 0 4<br> 23hex 16 8 0 0 4<br>1000,11 10,000 0,1000, 0000,0 000,00<br>00,0100<br>1000 1110 0000 1000 0000 0000 0000 0100 | 0x8E080004 |

4. Convert the following 32-bit machine code instruction into a MIPS instruction.
Use register names in your final answer, e.g. $t0 instead of $8.

| | |
|---|---|
| 1010 00,10 011,0 1000, 0000 0,000 00,00<br>1010<br>101000 10011 01000 00000 00000 001010<br>Op = 40 = 0x28<br><br>sb 19 8  0  0  10<br><br>sb  $s3  $t0  10<br><br>sb $t0 10($s3) | 0xA268000A<br><br>Doesn’t start with 0, not R |

5. Convert the following 32-bit machine code instruction into a MIPS instruction.
Use register names in your final answer.

| | |
|---|---|
| 0000 00,00 100,0 0101, 0001 0,000 00, 10<br>0110<br>000000 00100 00101 00010 00000 100110<br>0 4 5 2 0 40<br>0 $a0 $a1 $v4 0 26hex<br>xor $v0 $a0 $a1 | 0x00851026 |

6. Convert the following 32-bit machine code instruction into a MIPS instruction.
Use register names in your final answer.

| | |
|---|---|
| 0000 00,00 000,0 0000, 1000 1,010 00,00<br>0011<br>000000 00000 00000 10001 01000 000011<br>0 0 0 17 8 3<br>$0 $s1 8<br>sll $t0 3($s1) | 0x00008A03 |