Adam Gincel

*I pledge my Honor that I have abided by the Stevens Honor System.*

AND & ANDI

1. Both instructions perform the Logical AND operation. AND performs the operation on two registers, and ANDI performs the operation on a register and a constant.
2. They affect the status register the same way.
3. Bits S, V, N, and Z are affected.
4. Anything from R0 to R31.

ADD & ADC

1. Add adds two registers, while AddC adds with a carry bit, which allows for the storage of larger numbers in the event of overflow.
2. They affect the status register the same way.
3. Bits H, S, V, N, Z, and C are affected.
4. Anything from R0 to R31.
5. ADIW is the immediate mode ADD instruction. It immediately adds a value to a register pair, and operates on different registers.

ASR & LSR

1. ASR is an Arithmetic Shift Right, in which bit 7 is held constant, and bit 0 is loaded into the C flag, effectively dividing a signed value by two without changing its sign. LSR is a logical shift right, clearing bit 7. ASR works with signed values, whereas LSR works with unsigned.
2. The two functions affect the status register differently.
3. ASR affects bits S, V, N, Z, and C , and LSR affects bits S, V, N, Z, and C, while clearing N.
4. Registers r0 to r31 can be used.
5. ASR operates the way it does to enable dividing by two while still preserving sign.

Branching

1. BREQ branches when Rd is equal to Rr
2. BRLO branches when Rd is less than Rr.
3. BRSH branches when Rd is greater than or equal to Rr.
4. BRNE branches when Rd is not equal to Rr.
5. BRPL branches when Rd is positive.

Other

1. All of these functions are methods of calling subroutines. CALL is a long call to a subroutine within the entire Program memory, ICALL is an indirect call within the entire 4M (words) Program memory, and RCALL is a relative call to an address within PC - 2K + 1 and PC + 2K (words).
2. ST is a store indirect, STS stores directly to data space, and STD stores indirectly with displacement.
3. LD is an indirect load, LDI is an immediate load, LDD is an indirect load with displacement, and LDS loads directly from data space.