With reference to the classic RISC pipeline above, explain what a branch delay slot is and why it arises. [5 marks]

Demonstrate how conditional instructions can be used to avoid branches by writing code excerpts to perform the following function using a register-based processor. Comment your code to explain instruction semantics.

\[
\text{fun max}(a,b) = \text{if } a > b \text{ then } a \text{ else } b;
\] [5 marks]

To assist with subroutine calls, ARM processors have a branch-with-link instruction and Intel processors have a call instruction. How do these instructions differ from a simple branch? [5 marks]

What is an interrupt and how is it similar to a branch-with-link instruction on the ARM? [5 marks]