

1994 Paper 6 Question 1

Introduction to Computer Architecture

The MIPS R2000 architecture allows for up to four external coprocessors. Our local systems are configured with one: the R2010 Floating Point Accelerator (FPA).

Explain how the MIPS external coprocessors are used by describing, in architectural terms, what happens when the instructions below are executed. Details specific to floating point are *not* required.

```
lwc1    $f4, fdata           # $f4 is a floating point register
                                # fdata labels a data area
mtc1    $f6, $16             # $16 is a general purpose register
mul.s   $f4, $f4, $f2

mfc1    $f4, $17

add.s   $f4, $f4, $f6
swc1    $f4, fdata+4
```

[12 marks]

Give an example of an exception which is detected by the R2000 but concerns the R2010. [2 marks]

Give an example of an exception which is detected by the R2010. [2 marks]

What provision has been made for these exceptions to be signalled between the main processor and coprocessor? [4 marks]