Unix Case Study

(a) Draw a diagram of the address space of a Unix process. Indicate which parts may be shared with other processes. [5 marks]

(b) Explain the Unix system call mechanism. [5 marks]

(c) Describe how the fork system call is implemented. Discuss the mechanism from the viewpoint of efficiency and support for sharing between families of processes. How may a parent synchronise with the termination of a child? [6 marks]

(d) Contrast the execution by the shell of the commands

\[
\begin{align*}
c1 & > \text{file1} \\
c2 & < \text{file1} > \text{file2} \\
c3 & < \text{file2}
\end{align*}
\]

with the execution of the single command

\[
\begin{align*}
c1 & | \ c2 \ | \ c3
\end{align*}
\]

[4 marks]