2 Complexity Theory (AD)

(*a*) Give precise definitions of each of the following complexity classes:

(*i*) P;

(*ii*) L; and

(*iii*) NL.

[3 x 2 marks]

(*b*) State the Space Hierarchy Theorem.   [2 marks]

(*c*) For the purposes of this question, let L2 denote the complexity class SPACE$((\log n)^2)$.

For each of the following inclusions between complexity classes, state whether it is true, false or unknown, giving full justification for your answer.

(*i*) L $\subseteq$ L2;

(*ii*) L2 $\subseteq$ L;

(*iii*) L2 $\subseteq$ P; and

(*iv*) NL $\subseteq$ L2.

[4 x 3 marks]