Program verification- CC4085

Mechanisation of Hoare Logic

1. Conclude the proofs of:
   (a) Lemma 3.1
   (b) Lemma 3.2
   (c) Lemma 3.3
   (d) Theorm 3.1
2. Consider the system $\mathcal{H}_g$ and the functions VCG, VC and wp .
   (a) Apply the algorithm VCG to compute the verification conditions of the following program (substitute I by the invariant):

   Require: $\{y = i \wedge y \geq 0 \wedge z = j\}$
   while $y \neq 0$ **do** {I}
   $z \leftarrow z + 1$;
   $y \leftarrow y - 1$
   Ensure: $\{z = j + i\}$
3. Adequate $\mathcal{H}_g$ to a total correctness calculus, $\mathcal{H}_g^t$
4. Adequate the algorithm for verification condition generation (VCG) to the total correctness calculus $\mathcal{H}_g^t$.