The total number of points is 25.

**Question 1** (6 points). (a) Find the greatest common divisor of the numbers

70070 and 67914.

(b) Find the least common multiple of the same numbers.

**Question 2** (4 points). Answer ‘True’ or ‘False’. No support of the answer is needed.

(a) If $a|bc$ and $a$ does not divide $b$, then $a|c$.
(b) If $a|bc$ and $(a, b) = 1$, then $a|c$.
(c) If $a$ and $b$ both divide $c$, then $ab$ divides $c$.
(d) If $a$ and $b$ both divide $c$, then $[a, b]$ divides $c$.

**Question 3** (5 points). Use Induction to prove that $7^n - 1$ is divisible by 6 for all positive integers $n$.

**Question 4** (6 points). Determine if the equation $6x + 81y = 15$ has integral solutions. If yes, find all of them.

**Question 5** (4 points). Find the least nonnegative residues of

(a) $322986637 \pmod {10}$,
(b) $5^{19} \pmod {8}$.