COL202: Discrete Mathematical Structures. I semester, 2017-18.
Quiz 12
16 November 2017
Maximum Marks: 4

Name	**Ent. No.**

Important: Keep your answer within the box. Anything written outside the box will be treated as rough work. Do your rough work on the free space on the flip side of this sheet.

Q 1. (2 marks) The principle of mathematical induction says: Given a predicate, $p(x)$, defined over the natural numbers $\mathbb{N}$, if $p(k)$ is true for some $k \in \mathbb{N}$ and if $p(\ell)$ implies $p(\ell+1)$ for all $\ell \geq k$ then $p(x)$ is true for all values k and above. Write the principle of mathematical induction as a logical sentence using the notation introduced in class.

Q2. (2 marks) A graph $G = (V, E)$ is said to be k-colourable if there is a function that maps V to $[k] = \{1, \ldots, k\}$ in a way that no two endpoints of an edge have the same colour. Using the notation that $\mathcal{F}(V, k)$ is the set of all functions from V to $[k]$, write a logical statement that evaluates to true if G is k-colourable.