6. No, no matter $n > 1$ or $n = 1$.
   For example, let $V = V_1 \cup V_2$ where $V_1 = \{(x_1, \ldots, x_n) \in \mathbb{R}^n : x_1 > 0\}$
   $V_2 = \{(x_1, \ldots, x_n) \in \mathbb{R}^n : x_1 < -1\}$. $V$ is open in $\mathbb{R}^n$.
   Define $f : V \to \mathbb{R}^n$ by
   
   \[ f(x) = f(x_1, \ldots, x_n) = \begin{cases} x & \text{for } x \in V_1 \\ x + (3, 0, \ldots, 0) & \text{for } x \in V_2 \end{cases} \]

   Then $f \in C(V)$ and $Df(x) = I_n$ which is invertible $\forall x \in V$.
   But $f(1, 0, \ldots, 0) = (1, 0, \ldots, 0) = f(-2, 0, \ldots, 0)$
   i.e. $f$ is not 1-1 on $V$.

7. (i) Yes. By Thm 10.46.
   (ii) No. By Rmk 10.47.
   (iii) Yes. By Heine-Borel Thm, compact $\iff$ bdd & closed.
       By §10 1 Ex 10.(a), sequentially compact $\Rightarrow$ bdd & closed.
       By §10 4 Ex 10.(a), compact $\Rightarrow$ sequentially compact.
   (iv) No. Let $p$ be the discrete metric in $\mathbb{R}^n$, then $p$ is bounded.
   (v) No. See Example 11.11.