1) (a) Show that if $A \leq_m B$ and $B$ is computable, then $A$ is computable.
(b) Show that if $A \leq_m B$ and $B$ is computably enumerable, then $A$ is computably enumerable.

2) Show that $A$ is computably enumerable if and only if $A \leq_m K_0$ (where $K_0 = \{\langle x, y \rangle \mid x \in W_y\}$).

3) Show that if $A$ is computable, then for each nonempty set $B \subset \mathbb{N}$ we have $A \leq_m B$.

4) Show that $\leq_m$ is a partial ordering on $\mathcal{D}_m$.

5) Let $0'_m = \deg_m(K_0)$.
Show that the following are equivalent:
(a) $a_m \leq 0'_m$.
(b) $a_m$ is computably enumerable.
(c) Every $A \in a_m$ is computably enumerable.
Deduce that there is a greatest computably enumerable m-degree $0'_m > 0_m$.

6) (a) Let $A \oplus B = \{2x \mid x \in A\} \cup \{2x + 1 \mid x \in B\}$.
Show that for all $A, B \subseteq \mathbb{N}$
   i) If $A \leq_m A \oplus B$ and $B \leq_m A \oplus B$, and
   ii) If we define the join $a_m \cup b_m$ of $a_m = \deg_m(A)$, $b_m = \deg_m(B)$ by $a_m \cup b_m = \deg_m(A \oplus B)$, deduce that $a_m \cup b_m = \text{lub}\{a_m, b_m\}$.

7) (a) Let $C$ be a creative set with computable $f$ for which, for all $e$,
   
   $W_e \subseteq \overline{C} \rightarrow f(e) \in \overline{C} - W_e$.

   i) Show that if $A$ is c.e. then there is a computable $g$ for which

   $$W_g(x, y) = \begin{cases} 
   \{f(x)\} & \text{if } y \in A, \\
   \emptyset & \text{if } y \notin A,
   \end{cases}$$

   and a computable $k$ such that $W_k(y) = W_{g(k(y), y)}$.

   ii) Show that $y \in A \rightarrow fk(y) \in C$, and $y \notin A \rightarrow fk(y) \in \overline{C}$, and hence that $A \leq_m C$.
Deduce that every creative set $C$ is $m$-complete.