Question 12

(a) Given $\emptyset \in \{\emptyset\}$.
$\{\emptyset\}$ is a set containing only the $\emptyset$, therefore, the given statement is **True**.

(b) Given $\emptyset \in \{\emptyset, \{\emptyset\}\}$.
$\emptyset$ is an element of $\{\emptyset, \{\emptyset\}\}$, therefore, the given statement is **True**.

(c) Given $\{\emptyset\} \in \{\emptyset\}$.
$\{\emptyset\}$ is not an element of $\{\emptyset\}$, therefore, the given statement is **False**.

(d) Given $\{\emptyset\} \in \{\{\emptyset\}\}$.
$\{\emptyset\}$ is an element of $\{\{\emptyset\}\}$, therefore, the given statement is **True**.

(e) Given $\{\emptyset\} \subset \{\emptyset, \{\emptyset\}\}$.
Every element in $\{\emptyset\}$ is also an element of $\{\emptyset, \{\emptyset\}\}$, therefore the given statement is **True**.

(f) Given $\{\{\emptyset\}\} \subset \{\emptyset, \{\emptyset\}\}$.
Every element in $\{\{\emptyset\}\}$ is also an element of $\{\emptyset, \{\emptyset\}\}$, therefore the given statement is **True**.

(g) Given $\{\{\emptyset\}\} \subset \{\{\emptyset\}, \{\emptyset\}\}$.
Every element in $\{\{\emptyset\}\}$ is also an element of $\{\{\emptyset\}, \{\emptyset\}\}$. However, the sets are equal, therefore the given statement is **False**.