1. Which of the following correctly models a component of the Take-Grant model?

\[
\text{link}(X, Y) = X/g \in \text{dom}(Y) \lor Y/t \in \text{dom}(X)
\]

\[
\text{link}(X, Y) = Y/g \in \text{dom}(X) \lor X/t \in \text{dom}(Y)
\]

\[
\text{link}(X, Y) = Y/g \in \text{dom}(X) \lor X/g \in \text{dom}(Y)
\]

2. Which of the following statements is not true?

[ ] SPM model does not allow deletion and destroy operations as HRU does
[ ] SPM model subsumes multilevel security
[ ] HRU model subsumes Take-grant model
[X] SPM subsumes Take-grant as well as HRU model

3. Which of the following statements about confidentiality models is incorrect?

[ ] Confidentiality models are aimed at controlling flow of information
[X] Confidentiality models only address information flow that occurs because of transfer of rights
[ ] Confidentiality models do not give primary importance to who can alter information

4. Explain \textit{Separation of Duty}? Does it refer to confidentiality or integrity requirements?

\textit{Answer:}

Separation of Duty requires that different steps (tasks) of a critical function be carried out by different people.

SoD refers to the integrity requirements, mainly in transaction oriented systems.

5. Write the simple security and property of the Bell-LaPadula Model. Use \(l(s)\) and \(l(o)\) to mean the security clearance and classification of the subject \(s\) and object \(o\) respectively.

\textit{Answer:}

a. \(s\) can read \(o\) iff \(l(s) = l(o) \land s\) has read permission over \(o\)

b. \(s\) can write \(o\) iff \(l(o) = l(s) \land s\) has write permission over \(o\)