1. Which of the following statements about integrity (models) is incorrect?

[ ] Integrity models are aimed at controlling modification of information
[ ] Ensuring separation of duty is a crucial requirement of an integrity policy
[X] In Low-water mark model, if a subject $s$ writes to object $o$ and $i(s) < i(o)$
  (i.e., integrity level of $s$ is less than that of $o$), then the integrity level of
  subject $s$ is increased to $i(o)$.
[ ] Auditing is an essential requirement of integrity

2. Write T for true or F for false for the following statements.

Let Categories: \{Nuc, Eur, Asi, Us, Aus\};
  Sensitivity levels: \{Top secret \textgreater Secret \textgreater Confidential \textgreater Unclassified\}

[T] (Top Secret, \{Nuc, Asi\}) dom (Secret, \{Asi\})
[T] (Secret, \{Nuc, Eur\}) dom (Confidential, \{Nuc, Eur\})
[T] glb of \{Nuc, Eur, Asi\} and \{Nuc, Eur, Us\} is \{Nuc, Eur\}
[F] lub of \{Nuc\} and \{Eur, Asi\} is \{Nuc, Eur, Asi, Us\}

3. Let \(COI(\text{BankA}) = COI(\text{BankB}) = COI(\text{BankC}), COI(\text{SWCompanyY}) = COI(\text{SWCompanyX}),\) and \(COI(\text{BankA}) \neq COI(\text{SWCompanyZ}).\) Then which of the following are valid according to the Chinese Wall policy - indicate it by writing “x” on the corresponding box. Note that each sentence is independent of the other and multiple answers are possible!

[ ] A is assigned as consultant of BankA and BankB.
[X] A was a consultant of BankB sometime ago, now he is the consultant of
  BankC.
[ ] A is currently assigned to BankA and SWCompanyY (has read and write
  over the CDs of both the companies); B is assigned to BankB; and A and
  B are friends (belongs to the same consultancy company).
[X] A is a consultant of BankC and SWCompanyY.

4. Explain what do you mean by Tranquility?

Answer: Principle of tranquility states that subjects and objects may not change their
security levels once they have been instantiated.

5. Write the no-read-down and the no-write-up rules of the Biba’s Integrity Model. Use
\(i(s)\) and \(i(o)\) to mean the integrity levels of the subject \(s\) and object \(o\) respectively.
Also use \((s \text{ r } o)\) and \((s \text{ w } o)\) to mean \(s\) is allowed read access on \(o\) and \(s\) is allowed
write access on \(o\), respectively.

Answer:

a. \((s \text{ r } o)\) iff \(i(o) = i(s)\)
b. \((s \text{ w } o)\) iff \(i(s) = i(o)\)