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 > Secret > Confidential > 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*(BankA) = *COI*(BankB) = *COI*(BankC), *COI*(SWCompanyY) = *COI*(SWCompanyX), and *COI*(BankA) ? *COI*(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* **r** *o*) and (*s* **w** *o*) to mean *s* is allowed *read* access on *o* and *s* is allowed *write* access on *o*, respectively.

Answer:
   a.   (s r o) iff i(o) = i(s)
   b.   (s w o) iff i(s) = i(o)