1. **How do you guarantee that only three elves will ask questions?**

To guarantee that precisely 3 elves ask, there is an integer variable countElf that is incremented every time an elf calls AskQuestion. When countElf is precisely 3, the monitor sets elfGroupReady to 1 and awakens the condition condition_wakeSanta if Santa is asleep. Elves are waiting (condition_freeElves->Wait()) for at most 3 elves to be available before continuing so that only groups of precisely 3 elves visit Santa.

2. **Show why no elf will leave before the questions are answered.**

No elf can leave before their questions are answered because every elf invoking AnswerQuestion() waits on condition variable condition_answerSanta. The elves are released only when Santa sets the flag elfQuestionsAnswered to 1 in method AnswerQuestion(). Santa clearly notifies (condition_answerSanta->Signal()) 3 times, 1 per elf. So, an elf cannot keep returning to work unless Santa explicitly replied to the group's questions.

3. **Show that while three elves are waiting for an answer, no other elves can cut in and ask questions.**

To avoid interfering from other elves, elfGroupReady is set to 1 when precisely 3 elves are waiting. If elfGroupReady is equal to 1, the next elves attempting to ask a question are disallowed from asking a question by condition_freeElves condition until all questions in the current group have been answered (AnswerQuestion method is completed). Only if the current group has left (countElf = 0) and resets elfGroupReady back to 0, the waiting elves can start the next group of 3.

4. **How do you guarantee that Santa only answers questions while he is not sleeping?**

Santa responds to questions only after he is awake because his main loop (TSanta::ThreadFunc) calls monitor->Sleep() first which places Santa in a waiting state (condition_wakeSanta->Wait()) if no event is immediately available. It is only after being awakened (elicited by elves or reindeer via condition_wakeSanta->Signal()) that Santa then examines whether elves (countElf == 3) need help. Thus responding to questions (AnswerQuestion) happens strictly after Santa has been awakened from sleep explicitly.

5. **Show that when Santa is awoken by a reindeer, this reindeer is the last one coming back from vacation.**

The method ReindeerBack() uses an integer variable countReindeer to increment the count of reindeer back, It sets lastReindeer = 1 only when countReindeer == numReindeer (total reindeer). The last reindeer triggers the condition condition_wakeSanta->Signal() waking Santa up. Only the last reindeer to return back from holiday can wake Santa so it is correct.

6. **Show that while Santa is attaching the sleigh and delivering toys, all reindeer are there. That is, they won’t sneak out for vacation.**

Reindeer wait for attachment to the sleigh in ReadyForDeparture() function via condition condition_reindeerPending. The function verifies whether all reindeer (reindeerQueued == numReindeer) have arrived before proceeding. After everyone is queued Santa initiates attaching (AttachReindeerToSleigh()) and reindeer are released (condition_freeReindeer) only after delivery completion is indicated (FlyOff()). Thus no reindeer can premature departure because they're being held until delivery completion.

7. **Show that while Santa is attaching the sleigh and delivering toys, elves will not ask questions.**

Elves are prevented from interrupting deliveries using the elfGroupReady and elfQuestionsAnswered flags. While Santa is getting ready (AttachReindeerToSleigh()) and making deliveries (FlyOff()) elves attempting AskQuestion() examine the state of elfGroupReady and are blocked if they cannot immediately form a group or if Santa is busy (condition_freeElves->Wait()), Santa only resets these flags and allows further questioning by elves (condition_freeElfsignal()) after finishing deliveries and returning to sleep to effectively preventing elves from interrupting deliveries.