Problem 1: Plagiarism in Assignments

Problem Statement: As per the school policy, it is considered cheating if a student copies assignments from others. Student A copied an assignment from Student B, and Student B copied it from an online source. Student A is a registered student at the school.

Prove that 'Student A is involved in cheating.'

Step-by-step Solution:

1. If a student copies assignments, they are involved in cheating.

2. Student B copied from an online source (proof of copying).

3. Student A copied from Student B.

4. Student A is registered in the school (necessary condition for applying the rule).

Conclusion: Student A is involved in cheating.

Logical Tree Structure:

Cheating(Student A)

├── CopiedFrom(Student A, Student B)

│ └── CopiedFrom(Student B, Online Source)

└── Registered(Student A)

Problem 2: Library Fine for Late Returns

Problem Statement: As per library rules, a student is fined if they return a book after the due date. Student C borrowed a book from the library and returned it 5 days late. Student C is registered as a library member.

Prove that 'Student C will be fined.'

Step-by-step Solution:

1. If a student returns a book late, they will be fined.

2. Student C returned the book 5 days late (proof of late return).

3. Student C is a library member (necessary condition for applying the rule).

Conclusion: Student C will be fined.

Logical Tree Structure:

Fined(Student C)

├── ReturnedLate(Student C)

└── LibraryMember(Student C)

Problem 3: Eligibility for Sports Team

Problem Statement: To be eligible for the school sports team, a student must attend at least 80% of practices. Student D attended only 60% of the practices and is enrolled in the school.

Prove that 'Student D is not eligible for the sports team.'

Step-by-step Solution:

1. A student must attend at least 80% of practices to be eligible.

2. Student D attended only 60% (proof of insufficient attendance).

3. Student D is enrolled in the school (necessary condition for applying the rule).

Conclusion: Student D is not eligible for the sports team.

Logical Tree Structure:

NotEligible(Student D)

├── AttendedPractices(60%, Student D)

└── Enrolled(Student D)