Referential Integrity Rule in DBMS is based on Primary and Foreign Key. The Rule defines that a foreign key has a matching primary key. Reference from a table to another table should be valid.

Student_ID	Enroll Number	Roll Number	Name	Address	City	Dept_ID
1	AX001	1-BSCS-2018	John	Street 13 House 14	Lahore	3
2	AX002	2-BSBT-2018	Faiz	house 18 Defence Club	Karachi	4
3	AX003	3-BSEN-2018	Nouman	Street 19 House 20	Faislabad	5
4	AX004	4-PEEN-2018	Jerry	Street 18 House 29	Dubai	6

Dept_Id	Name	Phone Extension
3	Computer Science	398974
4	Botany	988784
5	English	898418

Anomalies :
1. Insert Anomaly : occurs when we insert an attribute which cannot be inserted without the mandatory presence of other attributes. We cannot insert a student with dept id 6 as that doesn't exist in the dept table.
2. Delete Anomaly : If deletion of an attribute leads to deletion of other attributes, it is deletion anomaly. Example : If dept Comp Sci deleted all related info deleted, if John deleted, all corresponding dept info deleted.
3. Update anomaly : Duplicated information updated at 1 instance and not other instances.

Functional dependencies :
Determinant → Dependent
Full and partial functional dependencies :
A → B
A - composite key
B - not already functionally dependent on a part of the composite key A
Example - Composite key = (studentID, ProfessorID)
Dependent = grade
(studentID, ProfessorID) → grade   ….Full functional dependency as grade can be found with the combination of sID and pID and not any 1 individually
Dependent = student name
(studentID, ProfessorID) → student name … Partial functional dependency as name can be found with studentID which is only a part of the composite key.
For partial dependency:
1. LHS should be a proper subset of CK
   AND
2. RHS should be a non prime attribute

Normalization is used to efficiently organize data to achieve following goals:
1. To eliminate redundant data
2. To ensure data dependencies hold true

1NF : No multivalued attribute. Single cell has a single value. "Atomicity"
2NF : 1NF + no partial dependencies
3NF : 2NF + no transitive dependencies (LHS must be CK/SK or RHS = prime attribute)
3NF madhe RHS can be a prime attribute
Condition: LHS = CK/SK or RHS is a prime attribute
BCNF Boyce Codd Normal Form : 3NF + determinant is always a super key (subset of CK)
But in BCNF, if A->B and A is non prime and B is prime is not allowed

Weak entity set : CK = primary key of strong + weak

BCNF example : CK = Patient name + Appointment ID
Time → Appointment ID -- - - - - - - - - - -non prime determines prime. Not allowed in BCNF
Another table for them

Doctor	Patient name	Appointment ID	Time