5.11 –
a. No violation.

b. violates Referential integrity constraint. Dnum is a foreign key in the table PROJECT however is a primary key in the tables DEPARTMENT and DEPT_LOCATIONS. If 2 is inserted into the Dnum in PROJECT, it will not be defined in the other two table.

A way to enforce the constraint is to insert the above attributes with Dnum 2 into the other two tables as well.

c. Violates Key constraint. Dnumber in the DEPARTMENT table must be unique for identification purposes. 4 already exists in Dnumber in the table so the insertion operates violates the key constraint.

A way to enforce the constraint is to change the Dnumber 4 to something that does not already exist in the table.

d. Violates Entity integrity constraint. In the update operation the Pno attribute is null, whereas Pno is a primary key in the table WORKS_ON. In the Entity integrity constraint primary key cannot be null.

A way to enforce the constraint is to change Pno to a valid integer matching the format of Pno in the table that is not null.

e. No violation

f. violates Referential integrity constraint. the WORKS_ON tuples with Essn = '333445555' is a primary key and refers to a primary key in the table DEPENDENT.

A way to enforce the constraint is to delete this attribute and all its references from all the tables in the database.

g. violates Referential integrity constraint. the EMPLOYEE tuple with Ssn = '987654321'. is a primary key and refers to a primary key in the table DEPENDENT.

A way to enforce the constraint is to delete this attribute and all its references from all the tables in the database.

h. violates Referential integrity constraint. The Pnumber is a primary key also referred in the table WORKS_ON.
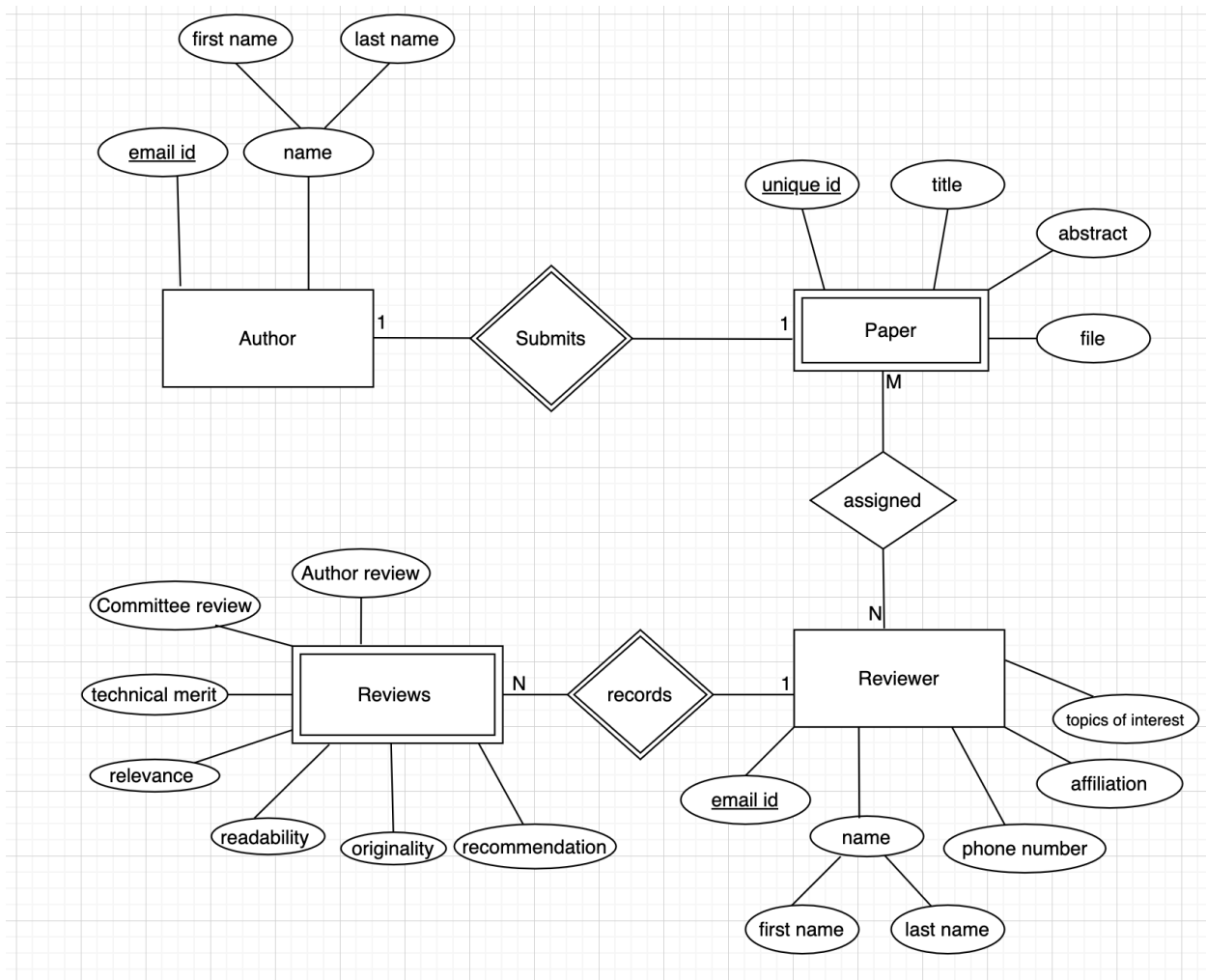
A way to enforce the constraint is to delete this attribute and all its references from all the tables in the database.

i. No violation.

j. No violation.

k. No violation.

3.34.

4.30