**1.Explain the relationship between the "Product" and "Product\_Category" entities from the above diagram.**

The relationship between the **“Product”** and **“Product\_Category”** entities from the provided database schema diagram is

**1**.The **“Product”** entity represents individual products in the system. It contains the following attributes:

**id:** An integer representing the unique identifier for each product.

**name:** A string (varchar) indicating the name of the product.

**desc:** A text field describing the product.

**SKU:** A string representing the Stock Keeping Unit for inventory management.

**category\_id:** An integer that serves as a foreign key referencing the corresponding category in the **“Product\_Category”** entity.

**inventory\_id:** An integer linking to the inventory details for this product.

**price:** A decimal value representing the product’s price.

**discount\_id**: An integer referencing the applicable discount (if any).

created\_at, modified\_at, and deleted\_at: Timestamps for record management.

**2.Product\_Category Entity**:

The **“Product\_Category”** entity represents different categories or types of products. It includes the following attributes:

**id:** An integer uniquely identifying each category.

**name:** A string (varchar) specifying the name of the category.

**desc:** A text field providing additional details about the category.

created\_at, modified\_at, and deleted\_at: Timestamps for record management.

**3.Relationship**:

The relationship between the **“Product”** and **“Product\_Category”** entities is established through the category\_id attribute in the **“Product”** entity.

Each product is associated with a specific category by referencing the corresponding category’s unique ID.

This relationship allows efficient categorization and organization of products within the system.

**2. How could you ensure that each product in the "Product" table has a valid category assigned to it?**

**We can use Foreign Key Constraint:**

Add a foreign key column in the “Product” table that references the category ID from the “Product\_Category” table.

This foreign key relationship ensures that each product must have a valid category ID associated with it.

For example, you can create a column named “category\_id” in the “Product” table, which references the “id” column in the “Product\_Category” table1.