First Answer

A diagram of a course

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Second Answer

1. Given table is in first Normal form as there are atomic values, same data type and same column name and assumption given that there are no repeating groups.

As per the given table, dependencies are

* INV\_NUM, PROD\_NUM QUANT\_SOLD
* INV\_NUM SALE\_DATE
* PROD\_NUM PROD\_LABEL, VEND\_CODE, VEND\_NAME, PROD\_PRICE
* VEND\_CODE VEND\_NAME

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1. Tables are decomposed to remove partial dependencies.
   1. **INVOICE** Table is shown below and is in 2NF in which SALE\_DATE directly depends on INV\_NUM(PK)

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* 1. **SALES** Table is shown below and is in 2NF in which both INV\_NUM and PROD\_NUM as a composite primary key determines QUANT\_SOLD.

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* 1. **PRODUCT** Table is shown below and is in 2NF in which PROD\_NUM(PK) determines PROD\_LABEL, VEND\_CODE, VEND\_NAME, PROD\_PRICE.

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1. To remove all the transitive dependencies, we need to still decompose the tables.
   1. INVOICE table is in 3NF and remain same

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* 1. SALES table also remain same and is in 3NF

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* 1. PRODUCT table contains transitive dependencies, and it should be decomposed in to two tables in which VENDOR table is created with VEND\_CODE as PK.

PRODUCT Table is in 3 NF as below

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VENDOR table is in 3NF as below

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